The evolution of discursive story-lines during socio-technical transitions: An analytical model applied to British and American road and rail transport during the twentieth century.

A thesis submitted to the University of Manchester for the Degree of PhD in the Faculty of Humanities

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The evolution of discursive story-lines during socio-technical transitions
Abstract

The evolution of discursive story-lines during socio-technical transitions: An analytical model applied to British and American road and rail transport during the twentieth century.

A thesis submitted for the degree of PhD
By John Cameron Dinsmore Roberts
25 September, 2015
University of Manchester

This thesis develops and tests an analytical model describing the development of discursive story-lines at the niche and regime levels during a socio-technical transition. The problem is considered from a longitudinal and symmetrical perspective, meaning that it accounts for both positive and negative story-lines about niche and regime technologies over the entire course of a transition.

The conceptual background of this thesis comes from Marteen Hajer’s account of discursive story-lines, which actors use to make sense of complex phenomena and problems. This thesis develops a four-phase analytical model to describe how these story-lines make sense of niche and regime technologies during a transition. This model is based on insights from two theoretical fields. The first is transitions theory, which describes how the relationship between niche and regime technologies changes over time, and suggests four moments of struggle during a transition. The second of these is Snow and Benford’s theory of frame resonance, which suggests four discursive resources which determine the appeal of story-lines. By combining these two theories, it is possible to identify the discursive resources available to niche and regime actors at different struggles during a transition, and the content of the story-lines that will be based on these resources. This leads to an analytical model in which niche and regime story-lines go through four identifiable phases as a niche technology replaces an incumbent regime. During each phase, story-lines promoted by niche and regime actors are shaped by the relationship of the two technologies to each other, the influence this has on niche and regime actors’ access to the four discursive resources, and by the ‘cultural landscape’, which accounts for large-scale changes in public cultural repertories.

This theory is tested using two case studies, based on primary historical research on the transition from a rail-dominated transport system to a road-dominated transport system in the United Kingdom and the United States. Each of these transitions is broken down into four periods corresponding to the four phases of the analytical model. For each period, research on newspapers, magazines, and political debates provides an account of the dominant story-lines in each period, which are then compared with the analytical model.

The findings of this research demonstrate that with some modifications, the analytical model is plausible. This has important implications for transitions theory, most notably that negative story-lines can be a destabilising influence in a socio-technical regime. It is also an important contribution to the debate over the role of conflict, politics, and contested understandings of technology during a socio-technical transition.
The evolution of discursive story-lines during socio-technical transitions: An analytical model applied to British and American road and rail transport during the twentieth century.

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This thesis describes how people’s understandings of technology change over time. Changes to technological systems are necessary to mitigate many of the harms associated with technological systems which we currently use, but these changes necessarily also entail changes to financial, scientific, cultural, political, and social systems. In order for any of these systems to change, it is necessary to confront, and possibly modify, peoples’ understandings of them. Peoples’ understandings of technology, and of the systems built around it, are therefore a crucial element in technological change.

These understandings are conceptualised as discursive story-lines, which help people to understand complex phenomena, and which organize people’s behaviour towards those phenomena. In a technological transition, these story-lines are often promoted by people with a vested interest in their content, many of whom are either actively promoting a radical niche innovation, or defending an incumbent technological system. As a new technology supplants an old one, proponents and opponents of both technologies will have access to a different mix of four story-telling resources. These resources are as follows:

- **Empirical credibility**, which describes how well story-lines fit with observed facts about the world;
- **Experiential commensurability**, which describes how well story-lines fit with the lived experiences of their audience;
- **Actor credibility**, which describes how well the audience trusts the people telling the story, and
- **Narrative fidelity**, which describes how well story-lines fit with deep cultural narratives.

Supporters or opponents of any given technology create story-lines which attempt to leverage as many of these elements of story-line resonance as possible. In doing so, however, they are constrained by material facts about the technology they are trying to promote or oppose. Story-lines promoting a brand new technology as a viable, dependable system, for example, may fail due to a lack of empirical credibility for an unproven technology. Story-lines promoting an old technology as new and exciting, however, might fail due to a lack of experiential commensurability, as the old technology has become boring and mundane for most of its users. By tracing the availability of these four resources during four periods of struggle that occur over the course of a transition, this thesis describes four phases which occur during a socio-technical transition, each of which contains a unique set of story-lines.

These four phases are tested using primary historical research into the story-lines which appeared during four periods during the transition from a rail-dominated transport system to a road-dominated transport system in the United Kingdom and the United States. This research demonstrates that the four-phase conceptual model described above can be seen at work in a real historical transition.
Declaration

No portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

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The evolution of discursive story-lines during socio-technical transitions

Dedicated to my grandfathers: Chesley Roberts and James Dinsmore.
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In all the PhD theses I have read, the acknowledgement section draws an analogy between the subject of their thesis and the process of writing it, using that to reflect on the author’s experience and the people that helped them along the way. I puzzled over how to do that for my thesis, which is primarily about conflict. Ultimately, I concluded that writing this thesis was not a conflict-ridden process. Far from being opposed every step of the way, as is the case for actors promoting a new technology, I encountered only kind assistance, regardless of which phase of the PhD process I was in. The best I can do to make this acknowledgement section fit my PhD’s subject matter, therefore, is to make it an historical narrative, covering all the people who have contributed over a decade of education to get me to this point.

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the people listed here, and many more besides. For that, I will always be grateful.

Manchester, 24 September, 2015.
Cameron Roberts grew up in Markham, Ontario, Canada. His academic career began with his undergraduate degree at the University of King’s College in Halifax Nova Scotia, where he pursued a combined honours degree in the history of science and technology, and philosophy. Cameron’s interest in the discursive history of transport began to develop during the summer of 2009, when he worked as a student research assistant at the Canada Science and Technology Museum in Ottawa, Ontario. His exposure to trade catalogues and old technological advertisements at the museum inspired his undergraduate thesis on the role of advertising in promoting and normalizing the early Canadian automobile.

After finishing his bachelor’s degree in 2010, Cameron spent another year in Halifax to raise money for further study, working as a teaching assistant in courses on the history of science and technology, and researching the history of Canadian nuclear safety for a project at the Canada Science and Technology Museum. In the autumn of 2011, Cameron travelled to the United Kingdom to pursue a Master of Science in Science, Technology, and International Development at the University of Edinburgh. It was during this Master’s Degree that Cameron was first exposed to transitions theory, which he applied in his master’s dissertation on the problem of providing air travel networks to remote communities in northern Canada, the Australian outback, and the highlands and islands of Scotland.

While finishing his Master’s degree, Cameron found funding for a PhD programme from the Darwin Trust of Edinburgh. This allowed him to begin a PhD programme at the University of Manchester in the autumn of 2012, ultimately producing this thesis with the help of supervisors Frank Geels and James Sumner.
The evolution of discursive story-lines during socio-technical transitions
Chapter 1: Introduction

1.1. Research Topic and Audience

On 2 November, 1959, British transport minister Ernest Marples instructed police officers to officially open the newly constructed M1 motorway, the first road of its kind in Britain. The press was thrilled by this development. The *Daily Mail* described the road as “one of the most modern in the world…it shows what we can do when we try”,\(^1\) while *The Times* noted that “those who ply the roads to the east, west, south, and north will feel a little envious…but their turn is coming”.\(^2\) The only complaint about the road was that there weren’t more like it: as the editor of the *Daily Mail* pointed out, “it stands alone in its glory”.\(^3\) The government wasted no time responding to these complaints, and by 1972 it had built over 1,000 more miles of motorway.\(^4\)

In 1997, another road construction project captured public attention, as activists dug a strip down Transport Secretary Sir George Young’s front lawn, and painted a white line down the middle. This hastily-constructed ‘road’ was a protest against the construction of the Newbury Bypass, a highway which had itself been the site of a pitched battle, in which activists occupied tree forts and tunnels in an attempt to stop the road from being built.\(^5\) A spokesperson for the group that had built the road on Young’s lawn urged him to “adopt an integrated transport policy rather than carrying on with more cars and more roads”.\(^6\) Protests such as this one received considerable public support, indicating that popular feelings about roads were now very different from the enthusiasm that had attended the opening of the M1 thirty-eight years earlier.\(^7\) These complaints also elicited a government response, as the Labour Government announced plans in 1998 to curb car use, rather than building new motorways.\(^8\)

Dramatic changes in how the public perceives technologies, such as the one discussed above, are an important element in how technological systems change over time. Equally important, however, can be the effect of stable attitudes in insulating technological systems against change. This is particularly obvious in the case of the automobile. The dominance

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\(^4\) Moran 2010, p. 80.
\(^5\) Moran 2010, p. 232.
\(^7\) Moran 2010, p. 236.
\(^8\) Dudley and Chatterjee 2011, p. 93
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of the private car in passenger transport causes many problems, such as high rates of air pollution and greenhouse gas emissions, as well as more than one million accidental deaths worldwide each year. Despite these problems, however, attempts at encouraging of alternative forms of transport, such as public transit or cycling, have been met with scepticism and outright hostility from the travelling public. Sociologists of transport have found that when asked about driving, research participants tend to discuss it in abstract and positive terms, while their accounts of public transport tend to emphasize their negative experiences.

This thesis aims to understand how people and institutions understand competing technologies during periods of socio-technical change. Technologies require the support of complex socio-technical systems, made up of connections between diverse elements including technologies, policies, financial arrangements, infrastructures, cultures, and user practices. These systems also include discourses, which constitute stable understandings of technologies and the wider systems supporting them. Technologies and discourses about them are contested during socio-technical transitions, which occur when radical innovations challenge, and potentially supplant, established socio-technical systems. Actors’ understandings of competing technologies during transitions can influence how they behave towards them, which in turn can influence the dynamics of the transition. This thesis discusses how discourses about both old and new technologies evolve during a transition, and how they influence wider socio-technical change.

The primary audience for this thesis is transition theorists, who study the conditions that influence stability and change in socio-technical systems. Historians of transport have illustrated that discourses about transport systems can have an important influence on the systems themselves. Motorways in several countries, including South Korea, Germany, and Italy, have been constructed as political symbols. The development of Portuguese car culture relied on socialist and democratic ideology, while utopianism played an important

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9 Ribeiro, Kobayashi et al 2007; Department for Transport 2015
10 World Health Organization 2013
11 Harman, Veeneman and Harman 2011; Parkhurst, Kemp et al 2011; Docherty and Shaw 2011; Dudley and Chatterjee 2011
12 Hagman 2003; Hagman 2010; Guiver 2007
13 Geels 2002; Unruh 2000
14 Sharp and Richardson 2001, p. 195
15 Geels 2002
16 Fairclough 1999; Bourdieu 1991
17 Berkhout 2002; Kemp 1994; Unruh 2000
19 Sousa and Marques 2013
role in the construction of the Belgian railway system. This ideological influence is likely to appear in the development of socio-technical systems besides transport, and will be important in transitions to more sustainable technology. While some transition theorists like to posit a hypothetical figure of a ‘transition manager’, who can strategically intervene in transitions, it seems unlikely that such an objective perspective is possible. Instead, anybody trying to bring about a transition must become an active participant in an ongoing conflict between different groups of actors, each of which has its own discourses about the technologies involved in the transition. A better understanding of how these discourses develop during a transition is therefore crucial for a better understanding of how conflict occurs during transitions. This understanding can in turn contribute to a better understanding of how socio-technical transitions can be encouraged.

1.2. Debate: Discourse and Culture in the Multi-Level Perspective

The debate addressed by this thesis concerns the account of discursive conflict in the multi-level perspective on socio-technical transitions (Figure 1.1), which accounts for transitions by reference to three conceptual levels:

The socio-technical regime, which exists at the meso level, refers to the socio-technical system arranged around a dominant technology. It is composed of diverse technical and social elements including technologies, policies, financial arrangements, user practices, science, and cultural attitudes. These are linked together in such a way that a change to any one element of a regime will affect all the other elements. Because each element of a regime has its own vested interests and socio-cultural inertia, this makes a regime highly resistant to change, and puts new technologies at a considerable disadvantage.

Protective niches exist at the micro level. New technologies typically emerge as “hopeful monstrosities”, which need time and support to develop in order to be more competitive. Initially, they cannot compete directly with the regime technology, due to their own imperfections, and the regime’s entrenchment. Niches provide protective spaces in which new technologies can be improved and embedded into their societal context, without having to compete against a dominant regime. This sheltered space can be provided by experimental niches,

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20 De Block 2011
22 Geels 2002; Geels 2011
23 Mokyr 1990.
The evolution of discursive story-lines during socio-technical transitions such as research labs or loss-making pilot projects, or it can occur in market niches, which appear when a new technology is competitive in some marginal context, such as the early recreational market for cars.24

The Socio-technical landscape refers to the exogenous context of a transition at the macro level. The landscape includes large-scale events such as economic cycles, wars, and major political or cultural shifts that can either handicap or enable niche-innovations and socio-technical regimes. Sometimes, pressure from the landscape can disrupt a regime and create an opportunity for niche-technologies to compete with regime technologies on more favourable terms.

![Diagram](image)

Figure 1.1: The multi-level perspective. From Geels, 2011.

24 Geels 2005b
The multi-level perspective is a useful theoretical basis for this thesis, because it allows researchers to consider the development of marginal new technologies alongside the dynamics of powerful incumbent socio-technical regimes, as well as developments in the wider socio-technical landscape. This is important for an account of discourse in transitions, because discourse plays a crucial role at all three levels. As a dominant force in the lives of many people, a socio-technical regime is subject to constant interpretation and reinterpretation. At the same time, the novelty of niche-innovations attracts attention and can generate public discursive struggles over technologies that are still very marginal. At the landscape level, popular public narratives influence discourses at the niche and regime levels. The multi-level perspective’s ability to account for multiple scales is therefore important for an account of discourse in transitions.

Despite its strengths, however, the multi-level perspective has been criticized as not sufficiently accounting for discursive and cultural struggles.25 Genus and Coles’ seven criticisms of the multi-level perspective, for example include three which directly concern the problems of discourse, politics, and culture.26 Smith, Voβ, et al similarly call attention to the need to better understand the politics of transitions within the multi-level perspective.27 Frank Geels, a key developer of the multi-level perspective, acknowledges that more work needs to be done on the role of conflict in transitions.28 This is an important problem, because existing transitions theory literature implies several important moments of struggle during a transition:

**Radical novelty.** The appearance of a new niche technology can precipitate a struggle over how to understand it. This struggle pits niche actors trying to maintain their protective space,29 against those who object to the new technology, possibly because it violates pre-existing cultural categories.30

**Fit-stretch dynamics.** As a new technology becomes more popular, it starts stretching and transforming its social context, rather than conforming with it as it did when it was more marginal.31 This transformation process disrupts settled ways of life, which will create conflict over how to understand not just the technology

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25 Jørgensen 2012
26 Genus and Coles 2008.
27 Smith, Voβ et al 2010.
28 Geels 2011
29 Smith and Raven 2012; Bergek, Jacobsson and Sandsen 2008.
30 Smits 2006.
31 Geels 2004; Smith and Raven 2012
The evolution of discursive story-lines during socio-technical transitions itself, but also the new policies, infrastructures, and social relations that accompany it.

**Contestation and Overthrow.** Regime actors have very strong political resources, which they can use against any niche innovation which poses a threat to them.\(^3^2\) At the same time, supporters of a niche-innovation that is on the verge of overthrowing a dominant regime will try to develop these political resources for themselves. This leads to political struggles between niche and regime actors.

**Regime Maintenance.** After a transition creates a new regime, discursive struggles over the interpretation of the regime will continue. A range of representations of the new regime develops out of these struggles.\(^3^3\) Some of these representations will be positive, while others will be critical. This leads to an enduring period of struggle over how the regime is perceived.

There are some existing attempts to develop an account of discursive conflict within the multi-level perspective. Bram Verhees' theory of cultural legitimacy argues that a new technology must be seen as acceptable within its social context in order to be effectively integrated into that context.\(^3^4\) Backers of a technology which lacks cultural legitimacy can expect to face resistance, which might include protests, heavy regulation, or even an outright ban. Verhees' mapping of the development of legitimacy over time, from emergence in small contexts, to wider extension, and possibly, eventual collapse, is particularly useful as a description of how discourse about technology changes over time. Verhees’ account, however, is asymmetrical, focusing on only one technology at a time, and failing to consider how the legitimacy of a niche technology can influence the legitimacy of a regime, and vice-versa. Verhees’ case study of nuclear power, on which his theory is based, does not consider the discursive relationship between nuclear power and other sources of energy.

Mimi Sheller’s cultural version of the multi-level perspective is another useful contribution to this debate (Figure 1.2).\(^3^5\) According to Sheller, standard discourses justify regimes, while counter-discourses at the niche-level challenge them, and structured stories at the landscape level influence the development of discourses at both the niche and regime levels. Unlike Verhees, Sheller considers niche and regime technologies symmetrically, paying attention to

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\(^3^2\) Geels 2014; Avelino and Rotmans 2009; Hess 2005.

\(^3^3\) Jensen 2012.

\(^3^4\) Verhees 2011

\(^3^5\) Sheller 2011
the debates between two different alternatives rather than over just one controversial technology. The flaw in Sheller’s perspective, however, is that it is static. There is no account of how the cultural elements of the niche, regime, and landscape change over time. For example, Sheller does not describe how the counter-discourses supporting a niche become the standard discourses of a regime during a transition. Sheller’s perspective is therefore a useful typology, but it does not account for the longitudinal processes of change that are a necessary part of socio-technical transitions.

**Table 9.1 Cultural Dimensions of the Mobility System**

<table>
<thead>
<tr>
<th>Niche Level</th>
<th>Regime Level</th>
<th>Landscape Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practices</td>
<td>Mainstream legitimized practices (e.g., using cars for shopping, school run, socializing, commute to work, etc.)</td>
<td>Locked-in material cultures stabilized as “background” quotidien practice and infrastructural interactions</td>
</tr>
<tr>
<td>Networks</td>
<td>Durable interest groups and governing structures; car-maker and other stakeholder cultures of interaction or brokerage</td>
<td>Family, friendship and work networks of connectivity, social capital and affective economies that shape mobility</td>
</tr>
<tr>
<td>Discourses</td>
<td>Counter-discourses that challenge dominant order: sustainability, health, anti-consumerism, ecology, livable streets and complete streets</td>
<td>Standard Discourses used to legitimate existing actors and practices and shape “common sense,” rationality and values</td>
</tr>
<tr>
<td></td>
<td>Structured Stories: ‘Joy of driving’; ‘Love affair with the car’; ‘Can’t do without it’; freedom and individuality (Freundendal-Pedersen, 2009)</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1.2: Mimi Sheller’s cultural multi-level perspective contains an account of practices, networks, and discourses at the niche, regime, and landscape levels. From Sheller, 2011.

Udo Pesch provides a third contribution. Pesch imagines niches and regimes as sets of discursive fields. According to Pesch, regime actors enjoy stable and protective positive discourses, while niche actors work to build up their own positive discourses. The insight that regime discourses are more stable than niche discourses is a good one, but Pesch makes the unwarranted assumption that all stable discourses at the regime level are positive. This is not necessarily the case: a regime could become associated with stable discourses.

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36 Pesch 2014
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negative understandings, which could be a persistent liability for regime actors, rather than an asset.

The question of how discourses operate in the multi-level perspective is therefore still an open one. There is ample evidence that discourses are important in transitions, but despite several valuable contributions to the discussion, there is still no complete account of how they develop at the niche, regime, and landscape levels over time. This thesis will attempt to provide such an account.

1.3. Contribution and Research Question

This thesis contributes to the debate outlined above by developing a symmetrical and longitudinal account of transitions that accounts for both supportive and oppositional discourses about technologies. It is symmetrical in the sense that it considers discourses about both niche and regime technologies. It is longitudinal in the sense that it accounts for discourses over the entire course of a transition, from the early appearance of a radical niche-innovation to the creation and maintenance of a new regime based on that technology. Finally, it accounts for both supportive and oppositional discourses, because both niche and regime technologies have supporters and detractors, who understand niche and regime technologies differently.

This account will be based on the assumption that transitions are the product of intentional decisions made by inventors, engineers, entrepreneurs, politicians, journalists, voters, consumers, and other actors. These decisions can be as small as one person’s choice to buy a car rather than continue relying on the bus, or as big as a government's decision to invest in a motorway network rather than a high-speed rail network. These choices are often controversial, and these controversies generate conflict over how to understand niche and regime technologies. This thesis will investigate how these conflicts play out over time. The thesis’s research question is as follows:

**How do positive and negative understandings of niche and regime technologies evolve over the course of a transition?**

This contribution will enrich the multi-level perspective’s account of discourse and struggle during transitions, which will be useful for those interested in encouraging transitions to sustainability. By illustrating the kinds of debates and discourses that to occur during a transition, it may be possible to anticipate and pre-empt the kinds of conflicts that impede transitions to more sustainable technological systems.
1.4. Outline of Thesis

The rest of this thesis answers this question using two convergent approaches. The first approach is conceptual, using a range of theoretical literature to describe how discourses develop in an ideal type of a transition. This, however, has to be grounded in a real-life transition in order to be valid in the real world. The second approach to answering the question is therefore historical. It uses primary-source research to develop a narrative account of the development of story-lines during the transition from a rail-dominated transport system to a road-dominated transport system in the United Kingdom and the United States. By reconciling these approaches, this thesis demonstrates that the analytical model that it proposes can account for discourse in a real-world transition. It also demonstrates some interesting elements of discourse in transitions that are not accounted for in the existing theoretical literature. The rest of this thesis is structured as follows:

Chapter 2: Literature Review and Conceptual Perspective. This chapter develops a conceptual framework to serve as a prospective answer to the research question. Section 2.2 uses foundational literature, including Marteen Hajer’s theory of discursive story-lines, as well as theories of culture, collective meaning-making, and frame-resonance, to outline the thesis’s basic ontological assumptions. Section 2.3 addresses literature from innovation studies, transitions theory, media studies, and political science which describe specific kinds of struggles occurring during transitions, and outline the discourses that emerge in response to these struggles. Section 2.4 uses the literature discussed in the preceding two sections to develop a four-phase analytical model describing the development of story-lines during transitions. Finally, Section 2.5 reduces this analytical model into a concise list of propositions that can be tested empirically.

Chapter 3: Methodology. This chapter develops a pattern-matching methodology which will be used to test the analytical model. Section 3.1 outlines a research strategy, in which real-life accounts of discursive conflicts provide an observational pattern which can be compared and contrasted with the conceptual pattern outlined in chapter 2. Section 3.2 explains why case studies of the transition from a rail-dominated transport system to a road-dominated transport system in the United Kingdom and the United States are ideally positioned to do this. Sections 3.3 and 3.4 outline the methods used to develop an historical account of discourse in each of these transitions.
Chapter 6: Conclusion. The final chapter compares the conceptual pattern established in chapter 2 with the observational patterns established in chapters 4 and 5, to determine how the analytical model accounts for the evidence from the case studies. Section 6.2 evaluates the propositions from section 2.4 in light of the evidence from the case studies, and illustrates that most elements of the analytical model fits well with the evidence from the case studies. Section 6.3 considers dynamics from the case studies that are not anticipated in the analytical model, and that can be used to enrich it. Section 6.4 considers to the basic architecture of the analytical model in light of the case study findings. In particular, it develops an alternative view of the temporality of discourses in transitions, to better account for an important mismatch in the American case. Sections 6.5 through 6.8 consider the implications of this thesis, including its generalizability, its relevance for present and future transitions, and its limitations. These sections demonstrate that this thesis not only enriches the account of discourse and culture in the multi-level perspective, but also demonstrates that story-lines constitute a new dynamic in transitions, and that unlike most elements of a socio-technical regime, discursive story-lines about a regime technology can be a destabilising influence, rather than a stabilizing influence.
Chapter 2: Literature Review and Conceptual Perspective

2.1. Introduction

This chapter develops an analytical model of how discursive conflict plays out over the course of a transition, using a combination of two approaches to theory-building. The first approach is inductive, and is based on existing, empirically-grounded literature describing the dynamics of specific struggles that occur during transitions. While this has the advantage of being supported by observational evidence, however, this literature by itself is not sufficient to create an account of transitions that is both symmetrical and longitudinal. A deductive approach is therefore used to develop an overarching logic for the theory which can fill the gaps left by the inductive approach. This is based on a set of axioms developed from key theoretical literature from transitions theory, cultural studies, and social movement theory. By matching up the inferences from these two approaches, this chapter develops an analytical model of discursive conflict in transitions that remains both comprehensive and empirically-grounded.

Section 2.2 discusses the ontological assumptions on which the conceptual framework is based. First, it describes Marteen Hajer's concept of discursive story-lines, which provide the basic unit of analysis to describe discursive conflict in transitions. Next, it reviews some additional theoretical literatures to develop the basic axioms underlying the deductive approach to theory building. These include literature from cultural studies, social movement theory and studies of cultural legitimacy.

Section 2.3 reviews the literatures informing the inductive approach to theory building. These literatures have been selected based on the four struggles occurring during transitions, as discussed in the previous chapter. Each struggle is addressed by its own set of theoretical literatures:

Radical Novelty, or the period where a new technology struggles to secure basic acceptability, is addressed by literature on visions, expectations, and hype, as well as the literature on legitimization. These literatures discuss how very new technologies are perceived by their supporters and critics.

\[37\] Hajer 1995
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**Fit-Stretch Dynamics**, or the process by which niche actors attempt to embed their niche-innovation into its social context, are addressed by the literatures on societal embedding and social movement theory, which describe how actors motivate for substantial social change.

**Overthrow**, or the period when the new technology, now part of a challenger regime, attempts to win the allegiance of key institutional actors, is addressed by the literature on policy paradigm shifts, which describes how major institutions change their fundamental goals and strategies.

**Regime Maintenance**, when supporters of a regime attempt to maintain its legitimacy, is addressed by the literature on issue attention cycles, which is relevant for the understanding of ongoing problems within a regime.

The literatures reviewed during this chapter cover a very wide range of disciplinary backgrounds and theoretical debates. This limits the depth to which each literature can be considered. Therefore, sections 2.2 and 2.3 are intended to survey the most important insights of each literature, and to draw connections between different theoretical perspectives and empirical observations. It is not the intention of this chapter to take detailed positions on specific debates within these literatures.

Section 2.4 outlines an analytical model describing the evolution of discursive story-lines during a transition. It mobilizes the material from section 2.2 to develop a general account of how story-lines develop, operate, and compete at the niche, regime, and landscape level. This, along with the literatures considered in section 2.3, is used to describe how story-lines develop during four phases of a transition, each of which corresponds to one of the moments of conflict described above. Due to the theoretical complexity of this model, section 2.5 reduces it to twelve key conceptual propositions. These provide a theoretical pattern which can be evaluated in light of the empirical case studies in later chapters.
2.2. Literature on Ontological Assumptions

2.2.1. Discursive Story-Lines

The word ‘discourse’ has a large number of definitions, but is commonly used as an umbrella term to refer to the sum total of human communication, particularly when that reflects a set of shared meanings. Shared discourses can create power relations, shape actors’ understandings of reality, establish institutional fields, facilitate the formation of coalitions, and influence policy change and stability. Cultural theorist Stuart Hall’s account of discourse explains that it “rules in” certain ways of talking about a topic, defining an acceptable and intelligible way to talk, write or conduct oneself, and also ‘rules out’ limits and restricts other ways of talking, of conducting ourselves in relation to the topic or constructing knowledge about it.” This constraining effect of discourse can help stabilize a socio-technical regime, by undermining the credibility of those who criticize the regime or propose alternatives to it. This is supported by Andy Stirling’s account of technological appraisal, in which powerful actors carefully select experts in an attempt to ‘close down’ discussions of technology.

Discursive studies of environmental politics have established the importance of discourse in providing shared understandings of complex phenomena. Adjer, Benjaminsen et al’s survey of environmental discourse illustrates that complex issues such as biodiversity loss, deforestation, climate change, and desertification are understood in fundamentally different ways by different stakeholders. Political scientist Marteen Hajer’s The Politics of Environmental Discourse develops the concept of discursive “story-lines” to account for how actors collectively assign meanings to complex environmental problems. Hajer argues that such problems, due to their complexity and interdisciplinary, defy purely factual understandings, and defines story-lines as “narratives on social reality through which elements from many different domains are combined and that provide actors with a set of symbolic references that suggest a common understanding”. Story-lines, in other words, provide simplified and comprehensible accounts of complex problems. Different story-

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40 Hall 2007, p. 72 in Phillips, Lawrence and Hardy 2004, p. 636
41 Stirling 2008
43 Hajer 1995, p. 45
44 Hajer 1995, p. 62
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lines facilitate different kinds of discourse coalitions, which have different perceived interests, and respond differently to political and social controversies.45

Socio-technical systems are subject to some of the same explanatory difficulties as environmental problems. Due to their heterogeneity, they are similarly mediated by specialist knowledge coming from a range of different disciplines of expertise, which can range from engineering and statistics to psychology and economics. This suggests that actors develop simplifying story-lines to describe socio-technical regimes, just as they do for environmental problems. Indeed, this has been observed empirically within many facets of socio-technical systems. At the firm level, Jasper Deuten and Arie Rip observe a “narrative infrastructure” that reduces complexity and uncertainty in the product development process.46 Historian of technology Martin Reuss argues that simplifying “techno-tales”, are used strategically by engineers during public negotiations over technology.47 Colin Divall, another historian, argues that techno-tales depicting the technological past and future have important implications for the present.48 As with Hajer’s story-lines, these narrative infrastructures and techno-tales serve as simplifying mechanisms, and have strategic implications for behaviour and planning.

This suggests that Hajer’s concept of story-lines can be applied to socio-technical regimes in addition to environmental problems. This thesis will therefore define a socio-technical story-line as a simplified narrative about a socio-technical niche or regime which makes it widely comprehensible. Stable socio-technical story-lines play an important role in transitions as described by the multi-level perspective.49 Favourable story-lines about a regime, which may have been strategically crafted by regime actors, can encourage approval and favourable treatment from the public, policy actors, and other stakeholders.50 Niche-technologies also require story-lines, since they are dependent on protective space that is discursively constituted.51 Niche actors will therefore attempt a similar simplifying exercise, aimed at encouraging story-lines about their new technology that are as promising as possible. Finally, actors opposed to niche or regime technologies can construct their own story-lines, which cast niche or regime technologies in a negative light.

45 Hajer 1995, p. 59
46 Deuten and Rip 2000.
47 Reuss 2008.
48 Divall 2010, p. 945.
49 Geels 2002.
50 Pesch, 2014.
51 Geels 2002; Smith and Raven 2012.
Cameron Roberts, 2015

2.2.2. Cultural Repertoires and Ideographs

While story-lines account for discourse at the niche and regime levels, the landscape level implies a role for deeper structures which influence niche and regime story-lines. Existing literature suggests that culture can fill this role. Culture, according to cultural theorist Ann Swidler, constitutes “…the publicly available symbolic forms through which people experience and express meaning.”\(^{52}\) In this view, culture, can be imagined as a set of repertoires, or a toolkit, rather than a set of hard and fast rules. Actors appropriate different elements of their cultural context in order to construct discourses that speak to their specific situation. Cultural theorist Jeffrey Alexander provides a useful example of how American political actors did this, as they “portrayed themselves as protagonists in simplified narratives, projecting their positions, arguments, and actions as exemplifications of sacred religious and secular texts. In turn, they ‘cast’ their opponents as narrative antagonists, as insincere and artificial actors who were only role playing to advance their interests.”\(^{53}\) Interestingly, politicians on opposite sides of a variety of American political controversies used the same basic set of symbolic codes, describing their own position as based in democracy and openness, and their opponents’ position as based in autocracy and secrecy.\(^{54}\) This suggests that in a transition, culture can be understood as a part of the landscape: It establishes the strategic opportunities available to niche and regime actors, but is itself separate from both the niche and the regime, and exogenous to the struggles between them.

Another illustration of how discourse can be understood at the landscape level comes from rhetorical scholar Michael McGee’s account of ideographs; a concept originally developed to make sense of how ideologies are played out in specific instances of political speech. Ideographs, according to McGee, include heavily loaded terms such as ‘property’, ‘rule of law’, and ‘liberty’, which have commonly agreed-upon and ideologically-charged meanings, but which can be used creatively by actors.\(^ {55} \) Because ideographs are likely to vary between different cultures and over time, they can be understood as one element of the cultural context of a transition, and can play a role in determining the kinds of story-lines that make sense at the niche or regime level.

This deep structure approach has already been applied to technological and industrial discourse. According to Harro Van Lente, ideographs such as “dangerous technology” and

\(^{52}\) Swidler 1986, p. 141
\(^{53}\) Alexander 2004, p. 52.
\(^{54}\) Alexander and Smith 1993.
\(^{55}\) McGee 1980, pp. 6-7.
“technological progress” can be compulsive for entrepreneurs and engineers, and influence the development of new technologies. Ivory and Genus argue that the Edwardian culture of masculinity had an important role in the rejection of electric cars in favour of gasoline cars. Lawrence and Philips demonstrate that new cultural narratives about whales influenced the creation of the whale-watching industry in British Columbia. Martijntje Smits argues that new technologies can face opposition if they violate pre-existing cultural categories. One hazard of Smits’ approach, however, is that it reduces actors appraising technologies to ‘cultural dopes’, and erases the non-cultural reasons for accepting or rejecting a technology. To avoid this dilemma, it is useful to re-emphasize Swidler’s view of culture as a repertoire, which enables diverse and even contradictory strategies of action to be informed by the same cultural background. This allows different responses to a technology to emerge from the same cultural background, just as niche and regime actors in direct competition with each other try to take advantage of the same socio-technical landscape.

There is one important discrepancy between the account of the landscape in transitions theory and these accounts of culture, however. While the landscape is implied to have the capacity for change, the literatures discussed above depict ideographs and cultural repertoires as static. These structures must change; however, otherwise all cultures would be the same. Cultural changes have the potential to play a big role in transitions, by undermining the story-lines used to support regime technologies, and potentially enabling positive story-lines about niche technologies. When this capacity for change is added to the existing account of cultural repertoires, it becomes very plausible that they can function as a part of the socio-technical landscape. This suggests that the cultural repertories discussed by Swidler form a “cultural landscape”, which, like other elements of the socio-technical landscape, can imperil or empower niche or regime actors, in this case by determining their opportunities for creating and promoting story-lines.

56 Ivory and Genus 2010.
57 Lawrence and Philips 2004.
58 Smits 2006.
59 Garfinkel 1967
60 Swidler 1986, p. 281.
61 Geels 2002.
2.2.3. Frame Resonance and Collective Meaning-Making

The previous two sections suggest that niche and regime actors compete to create compelling story-lines attaching meaning to both radical innovations and established systems, and that these story-lines are crafted strategically to take advantage of their cultural context. It is unlikely, however, that the cultural context is the sole determinant of a story-line’s success. A more nuanced model is needed to account for what makes a good story-line, and what makes a bad one.

Many accounts of discourse avoid any discussion of the relationship between discourses and facts about the world, because discourse theorists often see those facts as themselves discursively constructed. Sharp and Richardson’s application of Foucaultian discourse analysis to the field of environmental planning, for example, advocates a critical stance towards taken-for-granted knowledge, and notes that ‘truth’ can be shaped “through the exercise of power.” This ontological standpoint means that many theories of discourse do not provide an account of how discourse responds to events in the world, emphasizing instead how discourse is adopted and used by different actors with different interests. This thesis, however, aims explicitly to explain the evolution of story-lines over the course of a transition, which requires some account of how non-discursive developments influence the appeal of different story-lines. In order to account for what makes story-lines appealing, it is therefore necessary to understand this at least partially in light of external constraints such as technological progress or the construction of new infrastructures. Facts about these developments may well be discursively constructed, but these constructions are influenced by developments in non-discursive elements of the niche or the regime. A successful demonstration of a niche technology, for example, makes positive story-lines about it more tenable, while a demonstration that ends in disaster will facilitate negative story-lines. These kinds of developments must be taken into account to determine how story-lines change from one struggle to the next.

David Snow and Robert Benford’s model of frame resonance, developed to help understand the motivations of participants in social movements is a useful model which draws explicit connections between the development of discourse, and changes in a discourse’s material context. Discursive frames, according to Snow and Benford, set the

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64 Sharp and Richardson, 2001.
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terms for debates, categorizing what issues are ‘about’.\textsuperscript{65} Snow and Benford’s list of phenomenological constraints is a good guide for how discourse responds to its context. Following Snow and Benford’s logic, story-lines that score higher on each of the four categories below will resonate more strongly:

**Empirical credibility** refers to the extent to which a story-line is supported by tangible evidence.\textsuperscript{66} Empirically credible story-lines are story-lines that have the backing of scientific findings, common sense, or widely understood facts about the world.

**Narrative fidelity** refers to the match between story-lines and deeper cultural narratives.\textsuperscript{67} This category accounts for the role of the cultural landscape, as discussed in section 2.2.2. Actors will attempt to generate story-lines that resonate with the cultural landscape.

**Experiential commensurability** refers to a story-line’s match with the daily lived experience of its audience’.\textsuperscript{68} An experientially commensurable story-line is one that the intended audience can see replicated in their everyday lives.

To this list, I propose to add **actor credibility**, a concept used by Verhees in evaluating discursive conflict over British and Dutch nuclear power.\textsuperscript{69} Actor credibility describes the level of expertise and good intentions assumed of the actors promoting a story-line, or the actors depicted in a story-line. The importance of this is well-evidenced in Zachary Schrag’s account of the history of streetcars and buses in New York City, in which popular distrust of streetcar companies is demonstrated to have played an important role.\textsuperscript{70}

This perspective should be used with some caution, however. As argued by many discourse theorists, discourses are ultimately subjective constructs, and each of the items on the above list is itself discursively constructed. Empirical credibility, for example, relies on facts about niche and regime technologies which few if any actors have perfect access to. These facts are partly influenced by real developments in the transition, but are also discursively constructed. Similar caveats should be kept in mind for the appeal of cultural narratives or

\textsuperscript{65} Benford and Snow 2000, p. 614
\textsuperscript{66} Snow and Benford 1988, p. 208
\textsuperscript{67} Snow and Benford 1988, p. 210
\textsuperscript{68} Snow and Benford 1988, p. 208
\textsuperscript{69} Verhees 2011.
\textsuperscript{70} Schrag 2000
lived experiences, and for the trustworthiness of actors. Mimi Sheller and Jennifer Kent’s accounts of the lived experience of driving, for example, describe it as a hybrid of socially-constructed views of speed and driving, along with material aspects of the cars and the bodies that ride inside them.71 This implies that the experiential commensurability of story-lines about driving is discursively constructed, but that the material world puts limits on the kinds of discourses that can be plausibly constructed. This influence of the material context on story-lines allows the four elements of frame resonance discussed above to be used as a guide to what kinds of story-lines are likely to emerge in response to developments in niche and regime technologies during a transition.

This picture is still static, and does not account for changes to story-lines over time. Verhees’ theory of collective meaning making sheds some light on this. According to Verhees, discourses are the product of “an ongoing and contentious process that involves multiple actors interacting and engaging around specific issues in various arenas”72. This implies that “meanings that have been produced do not go away, after each struggle, but instead provide the background for subsequent rounds of collective meaning-making processes”.73 This means that story-lines are the result of an iterative process of negotiation (Figure 2.1).

Verhees’ perspective is well-demonstrated in his analysis of the cultural legitimacy struggles over nuclear power.74 It accounts for the stability of story-lines, but it also illustrates how actors can creatively modify long-standing story-lines in order to respond to specific struggles. Verhees’ account, however, focuses on just one technology at a time, and does not consider how story-lines pertaining to multiple competing technologies interact. If this is extended to apply to a multitude of discourses which can all influence each other,

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72 Verhees 2011, p. 31
73 Ibid
74 Verhees 2011
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however, then it can be a plausible account of how story-lines evolve over time: Actors try to capitalize on the deep structure and on the four resonance categories discussed above in order to craft story-lines that are more compelling than other story-lines promoted by competing actors (Figure 2.2).

Figure 2.2: Verhees’ model of meaning-making, modified to account for the discursive interactions between the proponents and opponents of a niche technology or socio-technical regime.

2.2.4. Theoretical Axioms

As discussed in the introduction to this chapter, the purpose of this discussion is to develop bedrock theoretical axioms which can be used to describe discursive conflict in transitions. Based on the discussion above, it is now possible to list these axioms:

1) **Actors in transitions develop discursive story-lines to make sense of niche and regime technologies.**
2) **Niche and regime actors attempt to craft appealing story-lines which encourage favourable understandings of the technologies they are promoting.**
3) **The appeal of story-lines is determined by how well they score on the four categories of empirical credibility, experiential commensurability, narrative fidelity, and trust.**
4) **The narrative fidelity of story-lines is determined by how well they make use of repertoires in the cultural landscape. Changes to the cultural landscape can destabilise story-lines.**
5) **Actors carry story-lines forward from one struggle to the next, and creatively modify them to respond to the needs of new struggles.**

These axioms inform the development of the conceptual perspective in the following section.
2.3. Literature on Story-line Dynamics

2.3.1. Visions, Expectations, and Hype

Because technological innovation is inherently future-oriented business, actors’ understandings of the future provide an important guide for their goals and strategies in the present. Researchers studying how actors understand the technological future have extrapolated useful findings from two key properties of story-lines about future. Firstly, stories about the future are impossible to reliably verify. Secondly, actors often have a vested interest in certain understandings of the future. These two facts make the future a useful discursive resource for actors in the present, as described by Mike Michael:

To enunciate a research question, to formulate a research programme, to outline a prospective technological system, to posit the coordination of industry, government, and university sectors in the pursuit of ‘sound technoscience’—all these entail statements made (or rather performed) in the present that draw (on) the past and the future. That is to say, there is a ‘fabrication’ of past and future that make these enunciations, formulations, outlines and posittings seem eminently sensible and do-able.

Visions are one kind of story-line about the future, which describe desirable or undesirable versions of the future which will result from actions in the present. The literature on visions demonstrates that they play an important role in generating support for niche-innovations, and are therefore likely to play an important role in positive story-lines about niche technologies. Bernhard Truffer demonstrates that visions of the future were crucial in the construction of protective space for car-sharing organizations. Matthias Weber makes a similar argument about the role of visions in sustaining an experimental combined heat-power infrastructure. Frans Berkhout provides a typology of visions, arguing that they can range from utopian to dystopian and from vague to highly specific. Berkhout argues that visions are emergent features of the transition which compete with each other as ‘bids’ for the most appealing future. According to Berkhout, visions depend on an open ‘possibility space’, which refers to the sum total of futures that actors can imagine. This can be connected to the concept of interpretive flexibility, a term from the Social Construction of Technology referring to the multiple, contested ways in which a new

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75 Geels and Smit 2000
76 Michael 2000, p. 22.
77 Berkhout 2006
78 Truffer 2003
80 Ibid.
81 Berkhout 2006.
The evolution of discursive story-lines during socio-technical transitions technology’s function and effectiveness can be understood. New technologies, which enjoy a high degree of interpretative flexibility, also enjoy a very open possibility space, which gives them an important discursive advantage. The ability of proponents of a new technology to promote it using a diversity of possible futures allows them to tailor their story-lines for a diversity of audiences.

![Gartner's hype cycle research methodology](image)

Figure 2.3: Gartner’s hype cycle research methodology. From Gartner, 2015

While visions of the future are normative, referring to what should or shouldn’t happen; expectations of the future are presented as neutral predictions about futures that will happen. The future cannot be reliably verified, however, and so expectations, like visions, might well be created by people with a vested interest in their content. This is illustrated in the scholarship on hype, or a surge of positive expectations which occurs during the early development and publicity of a new technology, and which play an important role in the development of positive story-lines for new innovations. The Gartner consultancy has developed a model of “hype cycles”, in which a technological trigger leads to an early peak of inflated expectations, followed by a trough of disillusionment as unexpected problems with the new technology are discovered (Figure 2.3). Further development, if it occurs, eventually leads to gradual improvements which eliminate these problems, resulting in a “slope of enlightenment”. The accumulation and subsequent collapse of hype is a predictable dynamic in the development of new technologies. Bakker and Budde’s game

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82 Pinch and Bijker 1984.
83 Van Lente 2012.
84 Alkemade and Suurs 2012; Bakker, Van Lente, and Meeus 2011; Galloway 2010; Pollock and Williams 2010; Rosenberg 1976.
85 Bakker and Budde 2012, p. 553.
86 Gartner 2015.
87 Bakker 2010; Alkemade and Suurs 2012; Geels, Pieters and Snelders 2007; Kitzinger 2008
theory analysis of hype illustrates why niche actors hype their innovations as a conscious effort in order to generate support.\textsuperscript{88} Hype offers a way for actors to develop excitement for a radical innovation before it has arrived on the market, which helps generate support for niche-innovations.

This literature demonstrates that open possibility space is an important discursive asset for niche actors, because it allows them to project technologies which are imperfect in the present into an imagined future. Because protective space within a niche must be discursively constructed, as demonstrated by Bergek, Jacobsson and Sandsen, and Smith and Raven,\textsuperscript{89} this advantage is very important for niche actors.

There is an important unanswered question in this literature, however: what becomes of stories about the future once the future actually arrives? Story-lines about niche technologies, featuring visions of the future, are likely to change dramatically once the technological future they predict actually exists, particularly if it does not fulfil the promises made by its early promoters. This literature also provides little consideration of the role of negative futures. A new technology seen as unsafe or problematic, for example, could experience a kind of inverted hype cycle, in which it is immediately met with an intense surge of objections and protests. A complete account of story-lines in transitions will have to account for both of these things.

2.3.2. Societal Embedding and Legitimacy

In order to grow beyond a small experimental niche, new technologies must to be embedded into their social, economic, and political contexts.\textsuperscript{90} The literature on societal embedding discusses how this occurs, particularly for technologies that might initially be poorly-suited to their context. Arie Rip argues that there are two important elements to this embedding: The creation of market demand, and cultural acceptance, for the new technology.\textsuperscript{91} Both of these require the crafting of stories portraying the innovation in a positive light. Deuten, Rip, and Jelsma argue that managers should approach embedding proactively, and should work towards a specific desired societal embedding.\textsuperscript{92} This suggests that firms attempting to promote new technologies within market niches will intentionally

\textsuperscript{88} Alkemade and Suurs, 2012; Bakker 2010; Bakker and Budde 2012; Brown 2000; Brown 2003.
\textsuperscript{89} Bergek, Jacobsson and Sandsen 2008; Smith and Raven 2012.
\textsuperscript{90} Geels 2014 .
\textsuperscript{91} Rip 1995.
\textsuperscript{92} Deuten, Rip and Jelsma 1997.
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attempt to either fit them to their social context, or to change the social context to better fit the technology.

Cultural legitimation is a crucial element of this embedding. For a technology to have attained legitimacy, it must be perceived as desirable and appropriate in its cultural context. Using a case study of nuclear power in the United Kingdom and the Netherlands, Bram Verhees argues that this is an important prerequisite for technological development. While legitimacy is important for both old and new technologies, it is particularly important for niche-innovations, as niche actors struggle to motivate for the acceptance of their innovation. Martijntje Smits approaches this problem from the perspective of Mary Douglas’ theory of pollution, according to which pollution is defined simply as “matter out of place”--a phenomenon which often elicits a hostile reaction. The problem with new technologies, argues Smits, is that because they do not yet have any established cultural understanding, there is not yet any context in which they can be understood to be “in place”. This means that actors supporting new technologies need to carefully fit them into their cultural context. While visions and hype, as discussed in the previous section play an important role in positive story-lines about new technologies, struggles over the cultural acceptability of new technologies can play an important role in creating negative ones. The implications of this are interesting when one considers the struggles that will occur as a new technology moves from fitting and conforming with its societal context to stretching and transforming it. An increasingly popular technology might begin to create its own categories, rather than fitting in with pre-existing ones as proposed by Smits. Smits’ perspective, furthermore, reduces the initial objections to new technologies to mere symbolism, when there could be real material effects underlying the debates about them. These are likely to get mixed up with cultural symbols, meaning that struggles over the cultural legitimacy of new technologies will include both symbolic and practical dimensions.

One important missing element of legitimation theory is that it tends focus on one technology in isolation, when in reality new technologies almost always emerge in the context of pre-existing technologies. The story-lines deployed in debates over the legitimacy of a new technology likely co-evolve with similar debates about the older technology with which it competes. An imperfect niche technology facing some cultural

93 Geels and Verhees 2011.
94 Geels, Pieters and Snelders 2007; Bergek, Jacobsson and Sandsen 34.
95 Smits 2006.
96 Smits 2006, p. 11
97 Geels 2004
resistance might nevertheless gain legitimacy more quickly if it competes with a widely despised regime technology. Story-lines seeking to establish the legitimacy of the niche technology can therefore be expected to emphasize the shortcomings of the regime.

The scholarship on legitimation and embedding outline a period of struggle, rather than the exact story-lines that niche actors and their opponents promote within that struggle. They demonstrate that new technologies face mismatches with existing political, social, economic, and cultural norms, which must be confronted by niche actors in order for a new technology to achieve wide adoption. Niche actors attempt to argue that their technology does fit these norms, or else that the norms should be changed to accommodate it. Regime actors and other opponents of the niche technology, meanwhile, might call explicit attention to these mismatches, in order to cast the niche technology as irreconcilable with its social context.

2.3.3. Social Movement Theory

As discussed in the previous section, actors promoting new technologies might have to motivate for changes to the technology’s social context in order to encourage societal embedding. Hargreaves and Haxeltine’s account of Eostre Organics provides a good example the importance of this. Eostre Organics, a British organic food company, was highly successful until it stalled in the face of infrastructures and consumption habits for which it was poorly suited. Their attempt to expand into hospital kitchens, for example, was foiled by those kitchens’ reliance on ready meals. Individual consumers, meanwhile, were frustrated by limited hours of Eostre’s market stall. Hargreaves and Haxeltine frame this case-study as a way of integrating the multi-level perspective with practice theory, but there is more at work here than just social practices. This case study illustrates that prevailing infrastructures, user habits, and institutional arrangements tend to favour the incumbent regime. This means that niche actors often have to advocate for specific, material and institutional changes in order to effectively embed their technology in society. Smith and Raven argue that niche actors must sometimes engage in “stretch-and-transform empowerment”, which adapts the selection context to the niche technology, rather than vice-versa. This implies that niche actors must become social movement actors, and advocate for societal changes that will facilitate the uptake of the technologies they promote.

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98 Hargreaves and Haxeltine 2011
99 Smith and Raven 2012.
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Lounsbury, Ventresca and Hirsch’s\textsuperscript{100} study of the development of recycling in the United States illustrates how these kinds of strategies can work in practice. Recycling, they argue, was only able to become a profitable industry due to certain key developments in the social context, including the willingness of consumers to voluntarily sort their waste, and the political rejection of the competing technology of waste incinerators. These developments were partly the result of environmentalist advocacy, and indeed recycling enjoyed considerable support from a voluntary movement of environmentalists. Lounsbury, Ventresca and Hirsch argue that these voluntary movements were created through shared “social structures of meaning”. This is similar to Hajer’s concept of discourse coalitions: Both concepts describe a set of shared discourses that unites people to advocate for social changes. Adrian Smith’s analysis of the alternative technology movement also illustrates the importance of shared identities and contexts in the sustaining of movements for socio-technical change.\textsuperscript{101} This implies that niche actors have to craft appealing story-lines to generate support for the changes necessary to embed their innovation in its societal context.

To relate this literature to the research question, it is necessary to understand the kind of story-lines that social movement actors promote in order to build support for their agenda. McCarthy and Zald offer a useful perspective on this. They argue that in creating demand for change, social movement ‘entrepreneurs’ respond to ‘demand’ for attention to problems.\textsuperscript{102} This might assume too much rationality on the part of social movements and their intended audience, but it is still probably true that social movements will be more successful if they appeal to widely perceived problems. Snow and Benford further support this by illustrating a process by which social problems are transformed into the motivation for specific social changes, via three core ‘framing tasks’:\textsuperscript{103}

**Diagnostic Framing** concerns the simple identification of a problem and its attributes.\textsuperscript{104} This is a basic prerequisite for a problem to be perceived as worth addressing.

**Prognostic Framing** concerns the best solution for the problems that have been identified through diagnostic framing.\textsuperscript{105} Even if a particular social condition is

\textsuperscript{100} Lounsbury, Ventresca and Hirsch 2003.
\textsuperscript{101} Smith 2005.
\textsuperscript{102} McCarthy and Zald 1977.
\textsuperscript{103} Snow and Benford 1988.
\textsuperscript{104} Benford and Snow 2000, p. 615.
\textsuperscript{105} Benford and Snow 2000, p. 615.
perceived as genuinely problematic, the solution that is adopted might not be what social movements are proposing. It is therefore necessary not just to identify problems, but to argue for specific solutions.

Motivational framing provides “a ‘call to arms’ or rationale for engaging in ameliorative corrective action.”\textsuperscript{106} Having established a problem and a prospective solution, social movement actors must now justify the costs of that solution.

This typology implies that niche actors pushing for social change promote story-lines containing three basic elements. First, they identify a problem to be addressed. Next, they argue that the problem is caused by pre-existing socio-technical arrangements, and that the problem can be ameliorated through a greater societal embedding of their technology. Finally, they issue a call to action that states the urgency and importance of the changes being proposed. This also gives regime actors and other opponents of the niche technology three points at which they can push back against the niche actors: They can argue that the problems cited by the niche actors do not exist; they can argue that further embedding of the niche technology is not the solution to the problem; or they can argue that the changes proposed by niche actors are too costly.

2.3.4. Policy Paradigm Shifts

There is good evidence that policy communities are an unusually durable component of a socio-technical regime.\textsuperscript{107} This is a problem for niche actors, because policy actors control crucial questions of regulation and infrastructure, meaning that their allegiance is likely to be necessary in order for a new technology to overthrow an incumbent regime.\textsuperscript{108} This constitutes a significant political change, and such changes often do not occur until the “right moment”, when the change becomes politically attractive.\textsuperscript{109} Unfortunately for niche actors, this moment does not necessarily occur at the same time that a new technology becomes a viable replacement for an old one. While it is necessary for a niche-innovation to be a viable regime in-waiting in order to attract support from policy actors, this may not be sufficient to secure their allegiance. A mature niche innovation might therefore spend a long time in a state where it can potentially replace the incumbent regime, before it gets the political support necessary to do so. Indeed, this support might never be forthcoming. This

\textsuperscript{106} Benford and Snow 2000, p. 614
\textsuperscript{107} Geels 2014b; Avelino and Rotmans 2009.
\textsuperscript{108} Van der Vooren, Alkemade et al 2012.
\textsuperscript{109} Lieberman 2002
section reviews political science literature describing how major policy changes, of the sort that can facilitate a transition, come about.

While some of the conflicts over changed policy agendas during a transition take place in closed political arenas, the tipping point of a transition will likely involve some policy changes that are highly visible to the public, and will therefore both require story-lines to justify them, and provoke story-lines condemning them. John L. Campbell’s account of ideas in policy change is a useful illustration of the content of these story-lines. According to Campbell, there are three kinds of ideas: Paradigms, which provide the cognitive background for policymaking; public sentiments, which constrain the range of politically acceptable solutions; and frames, which make solutions politically acceptable.\footnote{Campbell 1998; Campbell 2002.} Campbell’s model is somewhat problematic because it black-boxes the public, ignoring the role they might take in shaping their own frames, and in creating and questioning paradigms. But Campbell does illustrate that policy debates can frequently spill over from the policy realm into the wider public sphere. This spill-over implies that struggles over story-lines will play an important role during key moments of policy change in a transition.

Peter Hall outlines the specific circumstances under which this spill-over can occur.\footnote{Hall 1993.} According to him, normal policy deliberations are typically confined to policy experts under a stable policy paradigm, which sets out the organization’s goals. On rare occasions, however, a moment of crisis can upset the existing policy paradigm and the dominant conceptions of expertise, turning the discussion into a struggle of ideas between competing versions of what the organization’s goals should be in the future. Mark Blyth makes a similar point, arguing that ideas play a major role in moments of institutional crisis, during which actors’ interests are not clearly defined.\footnote{Blyth 2002.} Both of these perspectives have important implications for substantial policy changes which occur as a part of the overthrow of a dominant regime: Under a stable regime, reigning experts, who are likely to be beholden to the incumbent regime, will guide the incremental adjustment of policy relating to the regime and its competing technologies. In a period of crisis, however, this can be upset, allowing other actors associated with competing technologies to play a role in the shaping of new policy agendas.

For Hall, these crises result from “anomalies” in the existing paradigm, for example the stagflation that undermined the Keynesian paradigm prior to the neoliberal policies of the
1980s. Carter A. Wilson argues that “stressors,” or acknowledged problems with existing policy arrangements create pressure for policy change. A high car accident rate, for example, is a stressor on transport policies. Colin Hay similarly argues that the accumulation of contradictions in the established system can precipitate a crisis. The common thread in all these perspectives is that problems in existing policy arrangements create pressure for change, and if enough of this kind of pressure accumulates, it creates a policy crisis. This is a reasonable, but incomplete explanation for where policy crises come from, because it does not consider how problems in existing policies are socially constructed. Problems do not have any objective existence; they must first be interpreted and defined, as illustrated by Deborah Stone’s argument that to be seen as a problem, a situation has to be constructed as being amenable to human action. Problems can also be explained away by defenders of the incumbent policy paradigm. It is possible, for example, to blame bad conditions on the implementation of a policy paradigm rather than the paradigm itself. This is an important consideration for this thesis, because perceptions of problems in existing socio-technical regimes and the policies that support them are themselves a kind of story-line. The aforementioned problem of car accident rates, for example, will only be a challenge to the car regime if the car accidents are understood as avoidable tragedies, rather than an inevitable consequence of modern travel.

There are several competing accounts of policy change. The version proposed by Hall and Blyth has been used as a basis for this thesis because it contains the best account of ideas, which as discursive entities reflect the primary interest of this thesis. Other accounts of the policy process, however, can accommodate a similar process, even if they do not address it explicitly. In Paul Sabatier’s advocacy coalition framework, for example, policy is negotiated within a “policy subsystem”, consisting of advocacy coalitions, journalists, and policymakers. Policy brokers make decisions with the intention of minimizing conflict between these stakeholders, and these decisions feed back to the advocacy coalitions and to the outside world, both of which influence the next round of policy negotiations. Within this framework, big change comes from changes to socioeconomic conditions, changes in the predominant coalitions, or impacts from other policy subsystems. The punctuated equilibrium model of policy change also uses the concept of policy subsystems which, according to True, Jones, and Baumgartner’s account of it, allow the ongoing negotiation

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113 Hall 1993, p. 284.
115 Hay 1999.
The evolution of discursive story-lines during socio-technical transitions of an “equilibrium of interests”, as policies are negotiated in multiple parallel policy communities, outside of public attention. When this breaks down, forcing governments to consider the issues serially, it invites public involvement and greater change. In the multiple streams policy framework, windows of opportunity for significant change occur when developments in three separate ‘streams’ align. These streams are policy ideas, political developments, and problem dynamics.

Each of these alternative views attempts to account for two important phenomena: The stability of policy frameworks most of the time, and the capacity for sudden change on rare occasions. This literature review remains agnostic on the question of the underlying mechanisms of policy change, but adopts Hall and Blyth’s account as the most useful for this research because it illustrates that periods of significant change are mediated by a competition of ideas. This insight, which is unique to Hall and Blyth, is important for an account of story-lines at the tipping point of a transition. This thesis differs from their perspective on the question of where crises come from, however. Crises do not appear out of thin air, nor do they occur as the deterministic result of objective problems associated with the dominant policy paradigm. Social movement theory, covered above, and issue-attention cycles, covered below, both suggest instead that the problems that can precipitate crises are socially constructed. This gives niche actors attempting to challenge a policy paradigm something to do while it remains stable. Rather than waiting for a crisis to exploit; they can work to create one by crafting story-lines about problems with the existing policy paradigm. Once a crisis emerges, niche actors can promote story-lines presenting their niche as the rational way forward in order to court policy actors trying to decide on a new policy paradigm.

2.3.5. Issue-Attention Cycles

Theories of issue-attention cycles, which describe the way that social problems are constructed and understood, are an important contribution to an understanding of how story-lines relating to an incumbent regime and its problems evolve during struggles over regime maintenance. The models discussed below illustrate that this is a contested and competitive process, in which actors struggle for scarce public attention. This is an important rebuke to the uncritical use of ‘contradictions’ and ‘stressors’ presented in the

118 True, Jones and Baumgartner 1987.
119 Zahariadis 1999.
120 Kern 2011.
policy studies literature above, as well as an illustration of some of the struggles that will shape story-lines about a mature regime.

Herbert Blumer points out that understandings of social problems are not objective, but are negotiated among members of society. He proposes a five-stage process for this negotiation. The first stage is emergence, when a problem is recognized as a problem. The second stage is legitimation, when the problem is endorsed by prominent actors, giving it respectability. In the third stage, action has to be mobilized around the problem. The fourth stage is the formation of an official plan of action, which codifies an official understanding of the problem. The fifth stage concerns the implementation of the plan of action; a process which will entail unforeseen contingencies and unintended consequences.

Anthony Downs' issue attention cycle model takes a similar approach to that of Blumer, but adds the important inference that members of the public do not have infinite attention to devote to issues, and can get bored of issues that have been in the spotlight for a long time. This implies that column inches, airtime, and political speeches are the most important resources for actors trying to draw public attention to a problem. Downs’ model resembles the hype cycle model discussed above: A problem is first brought to public attention, resulting in a period of alarmed discovery and euphoric enthusiasm. Once the costs of addressing the problem are realized, however, the public gradually loses interest, and the problem moves into a “post-problem” stage where it receives only sporadic attention.

Downs’ approach is highly linear, a point brought up by McComas and Shanahan, who argue for the crucial importance of different narratives over the course of an issue lifecycle. This is based on a study which correlates changing narratives about climate change with the amount of media coverage of climate change receives; an unconvincing approach which uncritically assumes that correlation between these two factors must imply causation. Their theoretical point, however, is a good one: There are different paths which an issue can follow.

Bigelow, Faher and Mahon further develop this idea by proposing a typology of issue-attention cycles, which includes unidirectional cycles that abruptly stop or skip ahead due to a perceived crisis; as well as recursive cycles, in which the issue cycles in and out of

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121 Blumer 1971.
122 Downs 1972.
123 McComas and Shanahan 1999.
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public attention, or continues to attract attention but never mobilizes any action.\textsuperscript{124} They also introduce the 'interrupt', in which an issue goes dormant to be revived at a later time. This is important because once an issue is introduced; it does not necessarily need to appear in the media in order to be a public concern. Bigelow, Faher and Mahon’s framework, however is uncritical about “facts”, seeing them as a neutral resource for actors promoting problems, rather than something that is itself contested and constructed.

Penna and Geels' dialectical issue attention cycle model proposes a pathway in which issues can move backwards and forwards along a series of stages.\textsuperscript{125} Their first stage is problem articulation in social movements. This is followed by spill-overs to wider public debate, which includes a response from industry. Next comes political consideration of the issue, while industries engage in ‘hedging’ through incremental improvements through incremental changes. In the final stage, the industry responds by developing a new belief system around the problem. The dialectic nature of this model is useful. Industry actors can, for example, push a problem out of public debate by attempting to delegitimize it, at which point it will go back to being the concern of social movement actors.

All of these perspectives agree that it is not a straightforward process for a problem to attract public attention and inspire action. There are multiple hurdles which a critics of a regime must clear in order to attract public attention to problems in the regime. Each of these hurdles gives regime actors an opportunity to upset their efforts. This suggests that regime story-lines contain a wide variety of justifications, excuses, rationalisations, promises, or other rhetorical devices used to downplay the severity of problems with the regime. This is somewhat tempered by Bigelow, Faher, and Mahon’s notion of a dormant social issue, however. The existence of dormant issues suggests that if concern about a problem becomes pervasive in the mass media even for a short time, then it can persist after that time in the medium of ordinary conversation. This, in turn, suggests that even if a problem with a regime falls off the media radar, it could still generate stable negative story-lines about the regime which could challenge it during later periods of struggle. This gives regime actors a powerful incentive to avoid the widespread perception of problems with the regime.

\textsuperscript{124} Bigelow, Faher and Mahon 1993.
\textsuperscript{125} Penna and Geels 2015.
2.3.6. Summary of the Literature

The literatures surveyed above give an overview of the kinds of struggles and story-lines that can be expected during periods of socio-technical change. During periods of stability, regime actors can rely on stable story-lines about the utility and usefulness of the regime technology, but might suffer from perceptions of problems with the regime. Niche actors, meanwhile, promote visions and expectations in which their innovation features prominently in order to secure support and protective space for their innovation. As a niche technology begins to leave this protected space, it must be embedded in society, requiring niche actors to use social movement tactics to advocate for changes to institutions, social practices, and infrastructures. This task can be accomplished most easily by portraying the embedding of the niche-innovation as a solution to widely perceived social problems.

In order for a regime to be overthrown, major policy changes are necessary. These are difficult to bring about, because policy actors are likely to have close ties with the regime, and because policy paradigm shifts occur only during rare moments of crisis. Niche actors or other opponents of the regime can attempt to bring about such a period of crisis by calling attention to problems with the regime. This means that struggles over the definition of problems with a regime will be a constant occurrence while the regime remains dominant.
2.4. Analytical Model

This section combines the theoretical axioms in section 2.2 with the literatures reviewed in section 2.3 to develop an analytical model describing the evolution of story-lines during socio-technical transitions. The logic of this model combines dialectic and life-cycle motors for change.\(^{126}\) It models a transition as a predictable life cycle, during which the relationship between niche and regime technologies goes through predictable stages. Within these stages, however, it adopts a dialectic approach, in which niche and regime actors compete to control public understandings of the transition and the technologies and societal structures involved therein.\(^{127}\) Section 2.4.1 makes some general inferences about how story-lines develop at the niche, regime and landscape levels. Using these inferences, section 2.4.2 develops a four-phase model which tracks the development of story-lines at the niche and regime levels during a socio-technical transition.

2.4.1. Story-Lines in the Multi-Level Perspective

The resonance of a story-line is shaped by how well it scores on the five categories of frame resonance articulated by Snow and Benford,\(^{128}\) and discussed in section 2.2.3. The story-lines which benefit from the greatest combination of empirical credibility, experiential commensurability, narrative fidelity, and actor credibility are likely to be the most successful. Being aware of this, actors crafting these story-lines attempt to appeal to these four resources as much as possible.

The availability of these resources to niche and regime actors varies over the course of a transition, however. This variance can be inferred from the multi-level perspective, which, as discussed in chapter 1, accounts for socio-technical transitions by reference to three conceptual levels. Socio-technical regimes, at the meso level, are stable arrangements of heterogeneous socio-technical elements. Niches, at the micro level, are protective spaces in which radical novelty develops free from market selection. Occasionally, changes to the socio-technical landscape, or the exogenous context, can destabilise a regime, allowing a niche-innovation to break through and challenge the regime directly, potentially resulting in the formation of a new regime.\(^{129}\) This section combines the logic of the multi-level perspective with the logic of Snow and Benford’s frame resonance to describe the ability of

\(^{126}\) Van de Ven and Poole 1995.
\(^{127}\) Van de Ven and Poole 1995, p. 517.
\(^{128}\) Benford and Snow 1988
\(^{129}\) Geels 2002a; Geels 2005; Geels 2006.
niche and regime actors to tell compelling story-lines. It will also describe the role of culture at the landscape level in shaping niche and regime story-lines.

2.4.1.1. **Niche Story-Lines**

Niche actors need support in order to maintain their protective space and encourage the growth of their innovation. They also need support in legitimacy struggles against those who object to the emergence of the niche technology. One way for niche actors to attract this support is to promote appealing story-lines which cast their innovation in a positive light, and create discourse coalitions that will support it. It can be difficult for niche actors to tell compelling story-lines, however, because a new technology which is likely still a ‘hopeful monstrosity’\textsuperscript{130} will not enjoy very much empirical credibility. Niche actors are also unlikely to benefit from very much actor credibility, due to their lack of a track record in managing a functioning socio-technical system.

Visions of the future are a useful kind of story-line that can avoid these problems. By promoting story-lines about how the technology will perform in the future, niche actors can avoid having to talk about its imperfect performance in the present. The open possibility space enjoyed by new technologies,\textsuperscript{131} means that these visions will be very flexible. Visions about just one niche technology can portray a large number of different potential futures.\textsuperscript{132} At the time of this writing, for example, the future of 3D printing can be imagined as entailing production in shops, on peoples’ desktops, or in community spaces such as libraries.\textsuperscript{133} This flexibility makes it easier for niche actors to tell story-lines with a high degree of narrative fidelity, as they can flexibly adapt their visions to the cultural landscape. Niche actors may also be able to make use of experiential commensurability, particularly if some of their early market niches involve recreational uses which can be associated with fun and excitement, or if they can allow users to avoid having to use a regime technology that is seen as frustrating or unpleasant. It is also possible, however, for negative story-lines about a niche-innovation to develop experiential commensurability, if the niche technology causes problems for its users or people nearby.

\textsuperscript{130} Mokyr, 1990.  
\textsuperscript{131} Pinch and Bijker 1984  
\textsuperscript{132} Berkhout 2006  
\textsuperscript{133} Birtchnell and Urry 2013.
The evolution of discursive story-lines during socio-technical transitions

2.4.1.2. Regime Story-lines

Popular story-lines about technology can be very durable, and have lasting effects.\textsuperscript{134} This is an important feature of story-lines at the regime level: While they change in response to changes in society and in the regime itself, positive and negative story-lines about a regime have deep historical roots, and are carried forward from one struggle to another.\textsuperscript{135} Positive story-lines about the regime benefit strongly from empirical credibility. The regime technology will be more demonstrably functional than any competing niche-innovation, as illustrated by the fact that popular discourse about marginal transport systems, such as public transit, typically emphasizes their inconveniences and problems, while discourse about private cars emphasizes the convenience and freedom they embody.\textsuperscript{136} Regime actors also benefit from actor credibility; being seen as competent experts with a proven track record of managing a complex and important system. It is also possible, however, for regime actors to lose actor credibility if they are perceived to have abused their position of power, which will further empower negative story-lines about the regime. Negative story-lines about the regime can gain empirical credibility and experiential commensurability by reference to widely acknowledged problems with the regime.

2.4.1.3. The Cultural Landscape

The cultural landscape refers to those elements of culture which can influence the narrative fidelity of niche and regime story-lines, and which therefore function as a part of the socio-technical landscape. The cultural landscape can be understood in light of Swidler’s definition of culture as a set discursive repertories which can be creatively used by actors.\textsuperscript{137} Niche and regime actors attempt to align their story-lines with the cultural landscape in order to boost their narrative fidelity. When the cultural landscape changes, it can affect the narrative fidelity of niche and regime story-lines. This can have a particular importance for regimes, whose story-lines are more difficult to change, and may have been crafted to appeal to an outdated cultural landscape. As regime story-lines become less relevant, they can make the regime appear antiquated. This fits with the pattern in which the landscape can disrupt the regime, facilitating the success of niche-innovations.\textsuperscript{138}

\textsuperscript{134} Divall 2010; Pesch 2014.
\textsuperscript{135} Verhees 2011.
\textsuperscript{136} Hagman 2003
\textsuperscript{137} Swidler 1986
\textsuperscript{138} Geels 2002
2.4.2. Four Phases of Struggle

Table 2.1 summarizes the analytical model that will be described during the rest of the chapter. It is based on four phases of struggle during a transition, each of which corresponds to a different set of discursive resources available to niche and regime actors. This model should be seen as an ideal type, describing how story-lines play out during a technological substitution transition pathway,\(^\text{139}\) in which a radical new technology emerges in a marginal context, gradually grows in importance, and eventually replaces an incumbent regime technology. The phases discussed below should therefore not be understood deterministically, but instead as predictable patterns in story-lines that will occur if a transition proceeds according to this pattern. This can then be extrapolated to other kinds of transitions.

\(^{139}\) Geels and Schot 2007
The evolution of discursive story-lines during socio-technical transitions

### Struggles

<table>
<thead>
<tr>
<th>Phase 1: Radical Novelty</th>
<th>Niche story-lines</th>
<th>Regime story-lines</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Niche actors</strong></td>
<td>- Struggle for support and cultural legitimacy</td>
<td><strong>Niche proponents</strong>: Visions of the future portray the niche technology as exciting and promising.</td>
</tr>
<tr>
<td><strong>Regime actors</strong></td>
<td>- Struggle over longstanding problems and story-lines.</td>
<td><strong>Regime proponents</strong>: The regime’s proponents portray it as a stable, functional, and sophisticated system run by competent experts.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Phase 2: Stabilization</th>
<th>Niche story-lines</th>
<th>Regime story-lines</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Niche actors</strong></td>
<td>- Struggle to adapt their societal context to the niche innovation.</td>
<td><strong>Niche proponents</strong>: The niche technology is portrayed as a promising and viable alternative to the regime.</td>
</tr>
<tr>
<td><strong>Regime actors</strong></td>
<td>- Try to turn a threatening radical innovation into an incremental one.</td>
<td><strong>Regime proponents</strong>: Regime portrayed as a mature system free from the niche technology’s growing pains.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Phase 3: Overthrow</th>
<th>Niche story-lines</th>
<th>Regime story-lines</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The challenger and incumbent regimes struggle over the allegiance of key institutional actors.</strong></td>
<td><strong>Challenger regime proponents</strong>: The niche technology is associated with large-scale social and cultural changes heralding a better kind of society.</td>
<td><strong>Incumbent regime proponents</strong>: The regime is portrayed as being renewed for a new era, through incremental innovations.</td>
</tr>
<tr>
<td><strong>Challenger Regime Opponents</strong>: The new system is portrayed as undesirable and dystopian.</td>
<td><strong>Incumbent Regime Opponents</strong>: The regime technology is condemned as obsolete and old-fashioned.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Phase 4: Regime Maintenance</th>
<th>Niche story-lines</th>
<th>Regime story-lines</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Actors loyal to the new regime attempt to manage the perception of persistent problems within it.</strong></td>
<td><strong>New regime proponents</strong>: Positive story-lines persist from previous phases, and emphasize the regime’s credibility.</td>
<td><strong>Post-Incumbent regime proponents</strong>: The old system portrayed in nostalgic terms. Visions of the future predict a comeback in an improved form.</td>
</tr>
<tr>
<td><strong>New Regime Opponents</strong>: New story-lines emphasize problems with the regime.</td>
<td><strong>Post-Incumbent Regime Opponents</strong>: The old regime is condemned as obsolete.</td>
<td></td>
</tr>
</tbody>
</table>

Table 2.1: Summary of the conceptual model, outlining the most important struggles, and the story-lines promoted by both niche and regime actors and niche and regime opponents in response to these struggles.
2.4.2.1. Phase 1: Radical Novelty

During this phase, the niche-innovation occupies an experimental niche, or an early market niche, which protects it from outside market forces while its supporters attempt to demonstrate its viability as a technology. These protective niches, however, are vulnerable to collapse if they face too much external pressure. Regime actors, meanwhile, will be involved in their own continual process of problem negotiation. During this phase, therefore, both niche and regime actors are more concerned with opposition from civil society than from each other.

<table>
<thead>
<tr>
<th>Positive Niche Story-Lines</th>
<th>Empirical Credibility</th>
<th>Experiential Commensurability</th>
<th>Narrative Fidelity</th>
<th>Actor credibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weak. The niche technology is unproven.</td>
<td>Potentially strong, but only for small community of users.</td>
<td>Strong. Interpretive flexibility makes it easy to adapt story-lines to the cultural landscape.</td>
<td>Weak. Niche actors have no proven track record.</td>
<td></td>
</tr>
<tr>
<td>Positive Regime Story-Lines</td>
<td>Strong. The regime demonstrably works.</td>
<td>Strong. The regime fits with peoples’ normal experience.</td>
<td>Potentially strong. The regime technology can be seen as culturally important.</td>
<td>Strong. Regime actors are seen as trustworthy experts.</td>
</tr>
<tr>
<td>Negative Niche Story-Lines</td>
<td>Strong. The niche technology can be seen as fanciful and problem-ridden.</td>
<td>Potentially strong, if the niche technology inconveniences users or bystanders.</td>
<td>Potentially strong, if niche technology violates cultural categories.</td>
<td>Variable. This depends on who is opposing the niche technology.</td>
</tr>
<tr>
<td>Negative Regime Story-Lines</td>
<td>Potentially strong, if the regime technology causes problems.</td>
<td>Strong. The regime technology will be the focus of users’ everyday frustrations.</td>
<td>Potentially strong, if the cultural landscape has changed since the creation of regime.</td>
<td>Potentially strong, if regime actors are perceived to be unethical.</td>
</tr>
</tbody>
</table>

Table 2.2: The resonance of niche and regime story-lines during the radical novelty phase.

Predominant Struggles

The prevailing struggle for niche actors during this phase is to maintain their protective space. An important aspect of this is the struggle over basic legitimacy. Niches that fail to obtain a perception of legitimacy could face large-scale protests, restrictive regulations, and even violence and legislative bans on the niche technology. Regime actors are unlikely
The evolution of discursive story-lines during socio-technical transitions to meaningfully oppose the niche technology, and will be engaged in ongoing struggles over problems with the regime.

Niche Story-Lines

During this phase, niche technologies and the actors supporting them are unproven, meaning that positive story-lines about the niche technology have little empirical or actor credibility. Any positive story-lines emphasizing experiential commensurability, meanwhile, will appeal only to small groups of early adopters. Niche actors can use public trials and prototypes to try and build empirical credibility, but another strategy is for niche actors is to position their innovation in an appealing imaginary future through the use of hype, visions, and expectations.\(^\text{142}\) These story-lines about the future can be nimbly adapted to changes in the cultural landscape, and therefore enjoy considerable narrative fidelity. Niche actors can position their technology as more democratic, more efficient, more humane, more beautiful, more sustainable, more equitable, or more fun than established alternatives. Niche actors can also promote positive story-lines which capitalize on perceived problems with the regime, by envisioning futures in which a new technological system averts all the regime’s persistent problems.

Negative story-lines about the niche technology during this period will emphasize the problems that it creates in the present. Civil society actors opposed to the niche technology due to its practical consequences or violation of cultural values might try to drag niche story-lines from a utopian future back into the present by calling attention to problems with the niche technology’s imperfect present form. Story-lines portraying the niche technology as dangerous or as a nuisance could have a high degree of experiential commensurability if the technology causes injury or annoyance. Similarly, story-lines portraying the niche technology as useless could enjoy a high degree of empirical credibility if the niche technology has not yet demonstrated its practicality. Anti-niche story-lines might also trade on narrative fidelity by positioning the niche technology as being in conflict with established cultural categories.\(^\text{143}\)

Regime Story-Lines

Unlike niche technologies, established regimes can demonstrably be said to work. This means that positive story-lines about them have a high degree of empirical credibility as a functional and pragmatic system. Regime actors also benefit from a high degree of actor

\(^{142}\) Bakker, Van Lente and Meeus 2011; Lovell 2004; Smith 2005.

\(^{143}\) Smits 2006.
Cameron Roberts, 2015

credibility by virtue of their connection to this system. Finally, it is possible that some
positive story-lines about the regime technology will be old and beloved enough that they
will have ascended into the cultural landscape to become “techno-myths”, as was the case
with story-lines about the desirability of travel by rail during the early twentieth century.\footnote{144}
Regime story-lines are less flexible than niche story-lines, however, because regime
technologies have less open possibility space than niche technologies: For better or worse,
the public knows what a system based on the niche technology looks like.

The stability of regime story-lines is a double-edged sword, however, and negative story-
lines about the regime can also be deeply entrenched by this point. These story-lines can
benefit from the poor actor credibility of regime actors, if they are believed to have abused
their position of power.\footnote{145} Anti-regime story-lines can also gain narrative fidelity if the
cultural landscape has changed since the regime was created, making it appear old-
fashioned and out of step with the times. Persistent problems with the regime can also
become negative story-lines. These story-lines will enjoy a high degree of empirical
credibility if they reflect widely-acknowledged facts, and will enjoy a high degree of
experiential commensurability if they reflect common bad experiences with the regime. An
incumbent regime could therefore be the subject of story-lines portraying it as
inconvenient, destructive, untrustworthy, or inefficient.

2.4.2.2. \textit{Phase 2: Stabilization}

During the second phase of a transition, the niche technology has begun a process of
niche-accumulation, as it becomes more popular and viable.\footnote{146 This means that niche actors
are no longer merely trying to sustain protective space, but are instead trying to embed
their technology into societal structures and institutions, lest they share the fate of Eostre
Organics, as discussed in section 2.3.3. This requires niche actors to pursue
accommodation measures: adjustments to their societal context which improve the
performance of the niche technology, and facilitate its further expansion into more market
niches. These adjustments, however, require change to societal structures, which causes
conflict.

\footnote{144 Divall 2010.}
\footnote{145 Schrag 2000.}
\footnote{146 Geels 2004.}
Table 2.3: The resonance of niche and regime story-lines during the stabilization phase.

**Predominant Struggles**

There are limits to how long a growing niche technology can fit into its social context. As a niche technology gains new functionalities and a growing user base, it creates frictions with existing social practices, policies, and infrastructures that are poorly suited to it. Niche actors, emboldened by their success, respond to this by advocating social changes in order to better accommodate their technology.¹⁴⁷ This creates conflict between niche actors and civil society actors, such as policymakers, existing firms, and social movements, some of whom will be hostile to the changes proposed by niche actors. At this point, regime actors will recognize the niche technology as a threat, and may attempt to turn it from a radical innovation into an incremental one.¹⁴⁸ They will craft story-lines promoting the status quo as a preferable option to the radical change proposed by niche actors. At the same time, regime actors are still struggling against anti-regime story-lines during this period. This struggle has higher stakes at this point, as negative story-lines about the regime could further empower competition at the niche level.

¹⁴⁷ Hess 2005.
¹⁴⁸ Hess 2005.
As with other social movement actors, niche actors during this period link their story-lines with popular perceptions of problems. Positive story-lines about the niche technology therefore portray it as a promising solution to the problems in the dominant regime, arguing that if the niche technology is better accommodated, it can fix or bypass the problems with the regime. In order to do this, niche story-lines must complete diagnostic, prognostic, and motivational framing tasks: They must identify a problem with the regime, propose an expanded system based on the niche technology as a solution to that problem, and argue that the changes necessary to create that system are worthwhile. Positive story-lines about niche technologies can still use visions of the future during this phase, some of which may begin to feature new infrastructures or social practices, rather than the niche technology alone. These visions allow niche actors to nimbly connect their story-lines to prevailing landscape discourses, thereby benefiting from narrative fidelity. At the same time, however, as their system appears more viable, positive story-lines about the niche technology benefit from stronger actor and empirical credibility.

Negative story-lines about the niche technology continue to portray it as dangerous or annoying. These story-lines might become more compelling, gaining empirical credibility and experiential commensurability as the problems with the niche technology become more obvious. Anti-niche story-lines might also gain narrative fidelity if the social changes proposed by niche actors violate widely respected cultural norms.

During this phase, positive story-lines about the regime continue to benefit from empirical credibility and actor credibility, due to the demonstrable functionality of the incumbent system. Regime actors attempt to leverage this in story-lines portraying the regime technology as superior to the niche technology. Regime actors may emphasize problems with the niche technology, and craft story-lines emphasizing the fact that their own system is free of these problems. Another potential regime strategy is to challenge the niche actors’ definitions of problems within the regime. Regime actors can challenge niche actors’ diagnostic framing by claiming that the problems they cite do not exist; they can challenge their prognostic framing by claiming that greater accommodation of the niche technology

149 McCarthy and Zald 1977.
150 Benford and Snow 1988.
The evolution of discursive story-lines during socio-technical transitions will not solve these problems; or they can challenge their motivational framing by arguing that accommodation measures would be too costly.

Negative story-lines about the regime during this phase are much the same as they were in the previous phase; trading on persistent problems with the regime. Previously, however, anti-regime story-lines may have been muted by the fact that, for all its problems, the regime was the only way of filling a recognized need. Now that niche actors can trade on greater empirical and actor credibility, however, these anti-regime story-lines might reassert themselves with new force, and could feed into positive story-lines about the niche technology.

2.4.2.3. **Phase 3: Contestation and Overthrow**

By this point, the niche technology has expanded to the point that it can be called a regime in its own right, with its own infrastructure, social practices, policies, and bodies of expertise. It therefore makes sense to talk about two regimes during this phase; an incumbent regime, and a challenger regime, which has grown out of what was the niche during previous phases. The struggle between these two regimes could lead to the overthrow of the incumbent regime by the challenger regime.

<table>
<thead>
<tr>
<th></th>
<th>Empirical Credibility</th>
<th>Experiential Commensurability</th>
<th>Narrative Fidelity</th>
<th>Actor Credibility</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Positive Challenger Regime Story-Lines</strong></td>
<td>Strong. The challenger regime is now definitely viable.</td>
<td>Strong. The challenger regime is not only fully functional, but also new and exciting.</td>
<td>Potentially strong, if the challenger regime fits with the cultural landscape.</td>
<td>Strong. Actors within the challenger regime now run a fully viable system.</td>
</tr>
<tr>
<td><strong>Negative Challenger Regime Story-Lines</strong></td>
<td>Weak. Problems with the challenger regime can be avoided using visions of the future.</td>
<td>Weak. Frustrations with the challenger regime can be avoided using visions of the future.</td>
<td>Potentially strong, if new regime is seen as a threat to cultural norms.</td>
<td>Moderate strength. Challenger regime actors may have developed a bad reputation by now.</td>
</tr>
<tr>
<td><strong>Positive Incumbent Regime Story-Lines</strong></td>
<td>Strong, but no stronger than challenger regime.</td>
<td>Potentially strong, if the incumbent regime still functions well for its users.</td>
<td>Potentially strong, if incumbent regime actors can craft story-lines about renewal.</td>
<td>Strong. Regime actors still run a viable system.</td>
</tr>
<tr>
<td><strong>Negative Incumbent Regime Story-Lines</strong></td>
<td>Strong, if the incumbent regime causes harms.</td>
<td>Strong. Frustrations with incumbent regime remain important.</td>
<td>Potentially strong, if the incumbent regime is seen as obsolete.</td>
<td>Strong, if incumbent regime actors have a bad reputation.</td>
</tr>
</tbody>
</table>

Table 2.4: The resonance of incumbent and challenger regime story-lines during the contestation and overthrow phase.
Predominant Struggles

During this phase, both the incumbent regime and the challenger regime are proven, viable systems competing directly with one-another. A crucial element of this competition is over policy and politics. Favourable infrastructure, regulatory arrangements, and public funding are important advantages for the incumbent regime. In order to gain the advantage over the incumbent regime, actors supporting the challenger regime motivate for a policy paradigm shift. Such a shift depends on a period of ideological struggle, in which both notions of expertise and actors' interests are uncertain. 151

Challenger Regime Story-Lines

At this point the challenger regime is a fully functional socio-technical system which is self-evidently capable of replacing the incumbent regime. This increases the empirical and actor credibility of the positive story-lines about the challenger regime technology. At the same time, however, challenger regime actors can still propose radical visions of the future in order to avoid present-day problems and to pursue narrative fidelity, because so long as the incumbent regime remains dominant, the challenger regime will still be perceived as not having met its full potential. This is an important discursive advantage for the challenger regime during this period.

At this point, the two regimes score equally on empirical and actor credibility, and are each associated with their own set of positive and negative experiences. This means that narrative fidelity is an important deciding factor in the discursive competition between the two regimes. Positive story-lines about the challenger regime therefore trade on the cultural landscape, portraying it as part of a utopian future that reflects popular cultural narratives. Opponents of the challenger regime will envision the future it represents in a different light, portraying it in dystopian terms.

Incumbent Regime Story-Lines

During this phase, incumbent regime story-lines still draw on the empirical and actor credibility that comes with their connection to a proven, working system. As discussed above, however, this no longer gives them an advantage over the challenger regime, which by this point has also emerged as a proven, working system. Without this advantage, incumbent regime story-lines might be disadvantaged by the regime technology’s lack of novelty and discursive flexibility. Incumbent regime actors will promote story-lines that

151 Hall 1993; Blyth 2002.
The evolution of discursive story-lines during socio-technical transitions compensate for this disadvantage, associating their system with the present and future rather than the past.

One model for how they might do this comes from the “sailing ship effect”, whose name references an alleged improvement in sailing ship technology in response to the invention of steamships. Under the sailing ship effect, incremental innovations are applied to the regime technology when it comes under threat from a radical niche innovation. Whether or not this effect exists on a technological level is controversial, but regime actors can employ a similar strategy in crafting story-lines. To use the original example, even if sailing ships did not improve in response to the development of steamships, it might have made sense for the makers of sailing ships to say that they had. Positive regime story-lines during this phase therefore emphasize the renewal of the regime through incremental changes, emphasizing organizational, service, or aesthetic developments in the incumbent regime that fit with developments in the cultural landscape.

Negative story-lines about the dominant regime during this phase portray it as out-dated and backward. These story-lines continue to gain empirical credibility and experiential commensurability from connections to pre-existing negative story-lines about the incumbent regime. The presence of the challenger regime as an alternative further strengthens these story-lines.

2.4.2.4. Phase 4: Regime Maintenance

This phase occurs after a transition, when the challenger regime from the previous phase has supplanted the prior incumbent regime, to become an incumbent in its own right. The former incumbent regime, meanwhile, has become a post-incumbent regime, which may survive in a lesser form, or might disappear entirely. This phase features ongoing struggles over how to understand the now-dominant regime, as it ceases to be a new and exciting regime and becomes established and mundane.

152 De Liso and Filatrella, 2008.
### Predominant Struggles

At the beginning of this phase, the new regime goes through a honeymoon period, due to the temporary continuation of story-lines about the exciting future that it represents. As the regime stabilizes, however, less attention is drawn to its expansion and future potential, while more attention is drawn to its problems in the present day. Regime actors attempt to resolve these problems, or to draw attention away from them. If they fail at this, then concern about problems in the regime can become negative story-lines, which can in turn influence the formation of hostile discourse coalitions which might one day support competitive niche innovations or restrictive regulations.\(^\text{154}\) While this struggle over the new regime is occurring, the post-incumbent regime struggles to survive in a marginalized form.

### Regime Story-Lines

The new regime develops a monopoly on empirical and actor credibility, similar to that enjoyed by the old regime that preceded it. At the same time, visions of the future left over from previous phases allow the new regime to be seen for a short time as an emblem of progress towards an exciting future. Complaints against the new regime, whether due to bad experiences or negative externalities can be addressed by promises that they will disappear once existing systems of infrastructure, policy, and user practices are adapted to

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\(^{154}\) Johnson, Agnone and McCarthy 2010.
The evolution of discursive story-lines during socio-technical transitions

the new regime. The story-lines promoted during this period will become the basis for positive story-lines about the regime in the future.

As the possibility space of the new regime closes, optimistic visions about it become less credible. The increasing stability of the regime means that its supporters can no longer tell vague or abstract story-lines about the future. This makes negative story-lines about the regime more tenable. These story-lines gain experiential commensurability and empirical credibility from widely acknowledged unsolved problems with the regime. They also benefit from the low credibility of regime actors who are perceived to have abused their positions of power, for example, by overcharging the public or mismanaging their system. While problems can rise and fall in media attention and are often not acted on, unaddressed issues can create dormant negative story-lines about the regime, particularly if they match up well enough with the cultural landscape to benefit from strong narrative fidelity. If they become sufficiently entrenched, these negative story-lines can be very difficult for regime actors to eliminate, and might inspire a search for alternatives to the regime.

Post-Incumbent Regime Story-Lines

If the post-incumbent regime continues to exist after the overthrow phase, the story-lines attached to it change dramatically. Having been replaced, the old regime is no longer able to develop positive story-lines based on empirical or actor credibility: While the actors associated with it might once have run a dominant system, at best they now run a marginal system, and at worst they run one that has failed. Negative story-lines about the post-incumbent regime will therefore condemn it, and all the actors associated with it, as relics of the past.

The collapse of the post-incumbent regime, however also opens up its possibility-space once more, and this allows the development of new positive story-lines. Because the post-incumbent regime technology is no longer connected to a socio-technical system affecting peoples’ everyday lives, actors are now free to create new positive visions about what a complete, comprehensive, and updated version of the post-incumbent regime might look like. The post-incumbent regime can, furthermore, be nostalgically associated with positive cultural narratives about history, tradition, and simplicity. These positive story-lines can support the continued existence of an otherwise obsolete technology, and may even allow it to mount a renewed challenge to the regime that replaced it.

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155 Penna and Geels 2015.
2.5. Propositions for Testing

The analytical model presented above includes four relevant social groups crafting story-lines attempting to appeal to four categories of discursive resonance, during four distinct phases. This has led to a very complex model which is too unwieldy to empirically test in its entirety. For that reason, the detailed tables and explanations presented in this chapter should be understood as illustrating the inner workings and background justifications of the model. In order to be tested, the model has been reduced to three key propositions that are active during each phase, creating twelve propositions in total. These propositions have been chosen to highlight the most important struggles and story-lines occurring at the niche and regime levels during each phase described in the analytical model discussed in the previous section. The following list discusses the propositions for each phase, and the logic underlying each one.

Phase 1: Radical Novelty

Pro-niche story-lines emphasize the future rather than the present.

This proposition reflects niche actors’ dependence on narrative fidelity. Extrapolating from the literature on visions and expectations, the analytical model argues that niche actors compensate for their lack of empirical credibility, experiential commensurability, and actor credibility by using visions of the future, which can easily be adjusted to match the cultural landscape, thereby allowing for story-lines with a high degree of narrative fidelity.

Regime actors assert their expertise to challenge negative story-lines generated in previous and ongoing struggles.

This proposition is based on the conceptual framework’s account of positive and negative story-lines pertaining to the regime technology. Negative regime story-lines during this phase gain empirical credibility and experiential commensurability from struggles over observed problems with the regime. Regime actors respond to this by leveraging the empirical and actor credibility they enjoy as experts in a functional and dependable system.
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Story-lines challenging the niche technology’s legitimacy cast it as unproven, as dangerous, or as a nuisance.
This proposition reflects the niche technology’s limited credibility as a useful system during the first phase. Niche actors’ visions of the future will not be accepted by all actors, and many niche opponents will complain about the problems it experiences in the present. Complaints about these problems constitute the most compelling negative story-lines about the niche technology during this phase.

Phase 2: Embedding

Story-lines advocating accommodation of the niche technology cast it as a solution for problems in the regime.
This proposition reflects the fact that niche actors during this phase act as social movement actors who attempt to ‘stretch’ their social context to better accommodate the niche technology. In order to do so, they identify social problems that their technology can solve, and use this to motivate for further embedding of the niche technology into its societal context. The most obvious problems that niche actors can use for this purpose are the ones caused by the regime technology for which the niche technology provides an alternative.

Anti-niche story-lines emphasize its unintended consequences or social frictions.
As the niche technology becomes more popular and important, its negative consequences become more apparent. This increases the empirical credibility and experiential commensurability of story-lines portraying the niche technology as dangerous, as annoying, or as a threat to social practices. These story-lines will therefore become more widespread during the second phase.

Pro-regime story-lines cast the regime as a mature system, free of the problems plaguing the niche technology.
This proposition reflects the fact that as a competing niche grows in credibility, the regime no longer has a total monopoly on story-lines portraying it as a reliable, proven system. The niche technology, however, will still have many unsolved problems and mismatches with its social context, as discussed above. Regime actors
emphasize these problems, highlighting the criteria on which the incumbent technology clearly performs better than the niche technology. Story-lines promoting the incumbent regime by referencing problems with the niche technology will score highly on empirical credibility and experiential commensurability,

**Phase 3: Contestation and Overthrow**

**Story-lines about the challenger regime will connect it with a new kind of society, which is presented in utopian or dystopian terms.**

During this phase, challenger regime actors can promote story-lines portraying the system they support as a workable and dependable, regime-in-waiting. They still have to explain why the challenger regime is superior to the incumbent, however. They do this using visions, associating their technology with recent developments in the cultural landscape in order to depict it as part of a better future. Opponents of the challenger regime, no longer able to portray it as unreliable or problem-ridden, condemn it using negative visions about the dystopian society that will result if it becomes the dominant system.

**Pro-incumbent story-lines emphasize renewal of the regime through incremental innovations and new business models.**

Incumbent regime actors can no longer rely on an advantage in empirical credibility or actor credibility during this phase, as the challenger regime has become just as credible as the incumbent, and enjoys a considerable advantage in terms of narrative fidelity due to its’ supporters ability to use positive visions of the future in their story-lines. In order to offset this disadvantage, incumbent regime actors create their own visions, emphasizing the potential to renew the regime technology through incremental changes. This proposition reflects the discursive sailing ship effect discussed in section 2.4.2.3.

**Anti-incumbent story-lines will condemn the incumbent regime as an obsolete relic.**

The incumbent regime is likely to be perceived as vulnerable on the point of narrative fidelity during this phase. The incumbent regime will appear outdated compared to the challenger regime, and therefore not as well-associated with recent
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developments in the cultural landscape. The opponents of the incumbent regime will attempt to exploit this vulnerability by depicting it as a relic of the past.

Phase 4: Regime Maintenance

Pro-regime story-lines will become increasingly stable, making use of time-honoured tropes.
As the regime stabilizes and begins to display only incremental change, its supporters will be less able to use dramatic visions of the future in story-lines about it. Instead, therefore, they rely on stable positive story-lines which have become entrenched during the previous phases.

Negative story-lines will gradually stabilize around perceived problems with the new regime
As actors supporting the new regime can no longer look to the future to explain away unsolved problems, these problems will become more contested. Negative story-emphasizing new and ongoing problems and frustrations in the regime will therefore have a high degree of empirical credibility and experiential commensurability. Actors opposed to the regime will take advantage of this.

Story-lines in favour of the post-incumbent regime, if it still exists, will be nostalgic.
After it is supplanted in a transition, the post-incumbent regime will no longer look like a credible system. Positive story-lines about the post-incumbent regime can compensate for this by taking advantage of the re-opened possibility space. The fact that the post-incumbent regime no longer exists in the same form it once did means that it can be plausibly projected into an imagined past, just as radical innovations are projected into an imagined future through visions. Positive story-lines taking advantage of this fact can benefit from strong narrative fidelity, as actors supporting the post-incumbent regime are now free to reimagine how the regime used to function in ways that appeal to the cultural landscape, by referencing positive narratives about the past.
Chapter 3: Methodology and Methods

The next three chapters of this thesis illustrate the conceptual perspective described in chapter 2, using two case studies of the transition from a rail-dominated transport system to a road-dominated transport system in the United Kingdom and the United States. This will help determine how well the conceptual framework describes the development of discursive story-lines in real transitions. This chapter discusses the rationale behind this research strategy. Section 3.1 justifies the choice of a qualitative case study research methodology as a way of providing an observational pattern which can be compared with the conceptual pattern established in chapter 2. Section 3.2 explains why the transition from rail to road constitutes a paradigmatic case to illustrate the phenomenon of discourse in transitions, and why the United Kingdom and the United States are ideal contexts in which to study it. Section 3.3 refines this approach, setting out the temporal and thematic boundaries of the two case studies. Finally, section 3.4 provides a detailed account of the historical research methodology.

3.1. Research Strategy

The analytical model presented in the previous chapter constitutes an ideal type based on a combination of empirically-grounded secondary literature and theoretical deduction. This has produced a framework with some grounding in empirical observation, but which needs to be systematically compared with a real-world transition. This comparison will be carried out using a pattern-matching strategy. The propositions discussed in section 2.5 will provide a conceptual pattern.156 Chapters 4 and 5 provide an observational pattern to compare with this theoretical pattern, which takes the form of a detailed account of the development of story-lines over the course of an historical transition.

Story-lines about technology are complex and deeply embedded in their social context. An understanding of how story-lines develop generally in transitions therefore requires intimate knowledge of how story-lines have developed in specific cases.157 This suggests a qualitative case study methodology, which is well-suited to providing detailed accounts of complex or ambiguous phenomena in context.158 Research on a single case, however, can be difficult to generalize.159 This problem can be addressed by using a comparative case-

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156 Trochim 1985.
157 Flyvbjerg 2006, p. 25.
159 Gray 2009, p. 248; Gray 2009, p. 256
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study approach,\textsuperscript{160} in which two separate case studies are compared with each other and with the analytical model. This provides two observational patterns, rather than just one. By comparing both of these to the conceptual pattern established by the propositions in section 2.5, this thesis demonstrates which of the propositions hold across multiple contexts and therefore can plausibly be generalised further.

3.2. Case Selection

An important methodological challenge in case study research is drawing general conclusions from individual cases. A key component of addressing this challenge is choosing individual cases which are somehow broadly representative of the phenomenon they illustrate. Bent Flyvbjerg outlines three case selection strategies for accomplishing this:\textsuperscript{161}

**Extreme cases** use a dramatic example of the phenomenon in question. For example, a city with a very high crime rate might be used as an extreme case to indicate the causes of urban crime. Extreme cases are useful for getting a point across in a dramatic and memorable manner.

**Critical cases** have a strategic importance to the problem being studied. Robert Boyle’s demonstration that a feather falls at the same rate as a coin in a vacuum was an effective critical case demonstrating that weight does not affect falling rate, because a feather was a very light object that should have fallen much slower than a coin if weight was at all relevant to falling rate.

**Paradigmatic cases** function as reference points illustrating the general characteristics of the phenomenon in question. Charles Darwin’s account of the Galapagos finches is a good example of a paradigmatic case: the variation between species in one limited context is used to illustrate the general phenomenon of biological evolution.

An extreme case or a critical case would be infeasible for this thesis, because it would be very difficult to find a dramatic or strategically crucial example of discourse in transitions prior to substantial research. The cases used in this thesis will therefore be chosen to be paradigmatic cases, which highlight general characteristics of discursive conflict in transitions by examining how it occurs in a context where it is particularly visible. The

\textsuperscript{160} Gray 2009, p. 256
\textsuperscript{161} Flyvbjerg 2006, pp. 15-16.
passenger transport sector is a good candidate for a paradigmatic case, because transport infrastructures are physically large, widely used, highly visible, and important in the daily lives of virtually everybody. This means that a wide variety of story-lines related to passenger transport will emerge, and that the more successful ones will be voiced by a very large number of people. This makes the story-lines stand out dramatically during the transition, allowing them to be examined in detail, and to illustrate general patterns which might not be as visible in transitions that command less public attention.

Of all the transitions which have taken place in passenger transport, this thesis will focus on the transition from a rail-dominated transport system to a road-dominated transport system. There are two main reasons for this choice. Firstly, the transition from rail to road involves just two principal competing technologies, which will simplify the research. Transitions in urban passenger transport, in contrast, have involved a large number of separate transport systems, such as cars, streetcars, bicycles, horses and buses, which have interacted in complex ways and would all have to be studied in detail.\textsuperscript{162} Secondly, surface passenger transport normally takes place within a single country, unlike aviation or marine transport, where journeys often cross international borders. This facilitates the research by making it easier to draw boundaries around a case. Finally, a focus on intercity passenger transport is useful because of its temporal symmetry. In some countries, trains have recently re-emerged as an alternative to road transport.\textsuperscript{163} Railways, having been a dominant regime at the start of the twentieth century, were replaced by roads and reduced to the status of a post-incumbent regime by the 1950s, before emerging once again as a technology with the potential to challenge the road regime around the turn of the millennium. This has particular value for studying the regime maintenance phase; a full account of which must include story-lines about technologies proposed as an alternative to the regime. In other contexts, this could complicate the research considerably. In this case, however, railways are both the old regime which road transport replaced, and a competing niche-technology which is presented as a candidate to replace road transport. This allows this thesis to research just two competing technologies while accounting for the entire course of the transition.

The two case studies used in this thesis will be examined at the national level. This is to allow for identifiable differences in the cultural landscape, which can be linked to differences in niche and regime story-lines within the two countries. Intercity transport,
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furthermore, is often the subject of national controversies, due to its cultural, social, and economic impacts for a country. Furthermore, many media outlets are aimed at a national audience, meaning that discursive conflict occurs in an arena that encompasses an entire country. The specific countries chosen as case studies should have roughly similar economic, social, and political contexts during the transition, in order to eliminate as much as possible the role of these variables in influencing the transition, and better illustrate the role that competing story-lines might play. One way to ensure this symmetry is to choose two countries that are members of the OECD. There is a methodological trade-off here as choosing countries with a similar context will mean that more research is required to generalize this thesis’s findings to other kinds of contexts, but this is acceptable in order to isolate story-lines as a variable. There are also some pragmatic concerns for the case selection. Each should have easily accessible sources, and be predominantly English-speaking.

These criteria suggest 6 potential countries: The United States, Canada, the United Kingdom, Ireland, New Zealand, and Australia. Of these, the latter two can be eliminated right away due to the difficulties and expense involved in accessing archival sources located in those countries. Ireland can also be eliminated, because its history during the twentieth century is dramatically different from that of the other nations on the list. This leaves the United States, Canada, and the United Kingdom. Of these, the United States and the United Kingdom are the most information-rich sources, due to the fact that they have larger populations and media landscapes than Canada. Despite their similarities, however, the transition from rail to road occurred differently in the United States and the United Kingdom, which can facilitate useful comparisons between them. In the United Kingdom, railways have remained a viable, if marginal means of transport up to the present day, and have begun to experience growth once again around the turn of the millennium. In the United States, passenger railway travel collapsed to the point that the only way to save it was by a government buyout in 1971. While American trains have experienced a slight resurgence, they still remain very marginal in the American context. Furthermore, despite their common cultural heritage, the United States and the United Kingdom have different political cultures and national mythologies, which will have divergent influences on story-lines at the niche and regime levels, facilitating a study of the cultural landscape.

\[164\] Fouquet 2012.
\[165\] Wolf 1996, p. 80.
3.3. Time Period and Topic Focus

The transition from rail to road took a long time, meaning the years at which the historical narratives will begin and end must be chosen carefully. The case studies will begin with the emergence of cars and the early regulation of the dominant railway regime at the end of the nineteenth century. The British case study will begin in 1896, when cars were first meaningfully legalized for use on British roads, while the American case study will begin in 1887, when the first federal regulations for the railways were passed in Congress. After cars became dominant in the middle of the twentieth century, story-lines about cars and roads continued to be contested. Since the 1990s, scholars have observed a “peak car” phenomenon, which may be related to changing popular perceptions of cars.\textsuperscript{166} It is not feasible to go right up to the present day with the case studies in this thesis, because unresolved present-day controversies can make interpretation of recent history very difficult. The accounts of the transition in both cases therefore end with political changes that occurred around the turn of the millennium. The British case ends with the imposition of a congestion charge in London in 2003,\textsuperscript{167} while the American case ends in 2001, with the end of the Clinton presidency.

Another difficulty is presented by the fact that transport is a sprawling topic, which includes a huge variety of different technologies, policies, functionalities, interests, and issues. These would be impossible to cover in their entirety, meaning that the case studies also have to be limited to certain aspects of transport debates. Some topics related to passenger transport have therefore been partially or fully excluded from the historical narratives in order to simplify them. These topics are as follows:

**Labour:** Particularly in discussions about railways, labour issues were prominent in both the United Kingdom and the United States during much of the twentieth-century. Labour issues, however, involve conflicts that reach well beyond those concerning the technological makeup of a transport system. The case studies will therefore cover only those labour disputes which are directly related to technological change in the transport sector. Detailed accounts of labour struggles have mostly been left out.

**Public and Private Ownership:** Road and rail transport in both the United States and the United Kingdom have at times been run by both the private and public

\textsuperscript{166} Goodwin 2012; Newman and Kenworthy 2011.
\textsuperscript{167} Dudley and Chatterjee 2011, p. 96.
sectors. Controversies over the nationalisation or privatisation of rail or bus networks were sometimes, but not always, relevant for wider debates over the technological makeup of the transport system. These debates have therefore been considered where they are relevant to the contestation between road and rail, but have largely been left out because, like labour struggles, these controversies involve social, political, and economic debates that go beyond questions of transport.

**Freight:** Freight and passenger transport are not entirely separable. They use the same infrastructure and technology, often share the same finances, and involve many of the same principal actors. It is therefore impossible to ignore freight in this thesis. Freight, however, is less subject to public debate than passenger transport, and so struggles over freight transport have been considered in detail only when they have been a matter of major public controversy, or have had important implications for passenger transport.

**Aviation:** Aviation is an increasingly important element of the transport system in the later twentieth-century, particularly in the United States, where it competed with cross-country passenger rail. A full account of aviation would be interesting in the context of this research, but it is too big a topic to be covered in detail alongside two other socio-technical systems in a single PhD thesis. It has, accordingly, been left out entirely.

**Canals:** Canals formed the principal means of surface transport infrastructure in the United Kingdom prior to the railways, and were still used to some extent during the early twentieth century. As with aviation, they have also been left out, due to the time that would be required to consider them thoroughly.

### 3.4. Source Selection and Procedures

This project will use historical documents, to provide “physical traces” of social settings which occurred over the course of the transition from rail to road.\(^{168}\) These documents have been read in detail to develop a narrative account of the development of story-lines during the transition. This approach is inspired by William Sewell’s concept of “eventful temporality”; a view which recognizes history as a contingent, event-driven process.\(^{169}\) This approach is useful because technological story-lines develop contingently in response to technological and discursive events.

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\(^{168}\) Coffey 2014, p. 367.

\(^{169}\) Sewell 2005.
In order to determine which story-lines were most popular at different times during the transitions, texts have been sought out that were created by actors with an incentive to appeal to members of the general public. These actors include politicians, journalists, popular fiction and nonfiction writers, advertisers, and correspondents to major newspapers. Because these actors have a good strategic reason to make use of popular public story-lines, it follows that the story-lines they use reflect the story-lines that were popular more generally. This focus on general popularity, rather than on story-lines of interest to policymakers or actors within firms is intentional, and has two benefits. Firstly, a focus on the public at large reveals the story-lines preferred by people with different relationships to the transport system. Secondly, a focus on non-expert actors better illustrates how people make sense of complex socio-technical systems that they cannot easily understand. Story-lines found in a variety of different fora, and originating from a variety of different actors with different interests, are more likely to have a wider degree of public resonance.

The sources used for the case studies have been selected with an eye to a few criteria. Popular magazines and newspapers were selected on the grounds that the story-lines presented in them would be aimed to appeal to a wide audience. Another important criterion was diversity: sources were also sought to reflect audiences with a diverse range of class backgrounds, geographic locations, and political views. The next criterion was longevity: Sources that existed for a long period of time permit the longitudinal story of story-lines in that source over a long period of time. The final criterion was availability. Sources had to be relatively easily accessible from a research base in the United Kingdom. Sources that could be found in digital archives that allow rapid keyword searches were particularly useful for this study, given the very large number of primary documents necessary to evaluate story-lines pertaining to two technologies in two countries over a hundred-year period. The following list explains the selection rationale for all of the sources used in this thesis.

**Newspapers:** Editorial content in newspapers contains examples of story-lines that were popular outside of specific communities of niche or regime supporters. Newspapers were chosen for popularity, and to reflect diverse political viewpoints, as well as tabloid and broadsheet formats. While most major British newspapers have historically been based in London, American newspapers were also selected for geographic diversity. Secondary sources on the history of British and American newspapers have been used to provide context on the backgrounds of different
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newspapers. In order to facilitate a survey of a large volume of newspaper content, newspapers that exist in digital archives accessible via the University of Manchester Library were chosen.

**Political debates:** Legislative debates illustrate the story-lines that were important in the justification of key policy choices during the transition. In the United Kingdom, Parliamentary debates are provided in a highly accessible form in the online parliamentary Hansard at hansard.millbanksystems.com. This made it easy to look up the debates on specific pieces of legislation, and to conduct keyword searches for important terms. In the United States, Congressional debates from prior to 1989 exist only in hard copy, which is very time-consuming to read. These bound Congressional records were therefore used for only the most important pieces of legislation. To offset this, records of Presidential speeches were used, as these are available in a convenient digital form at the Miller Center Presidential Speech Archive, hosted by the University of Virginia.

**Car magazines:** Car magazines reflect the story-lines most popular among the car industry, as well as car enthusiasts. The car magazines used in this research were all popular titles whose publication history covers a long period of time. Car magazines that cater to niche markets, such as auto mechanics and salesmen, sportscar enthusiasts, or fans of car racing, were left out in favour of more general interest publications.

**Rail magazines:** Railway magazines offer an opportunity to see which story-lines were most popular among supporters of the railways. Many railway magazines in both the United States and the United Kingdom, however, are aimed at small communities of enthusiasts, business professionals, or hobbyists. The railway magazines chosen for this study were therefore chosen for longevity and popularity as with the car magazines, but also for being aimed at as wide an audience as possible. In practice, this usually meant magazines that attempted to appeal to both industry professionals and railway enthusiasts.

**Advertisements:** Advertisements provide another view of the story-lines portraying the railways and cars in the most positive light. Advertisements were chosen for availability in magazines and archival collections. Advertisements in magazines were selectively photographed, while advertisement collections at the
National Railway Museum and the Henry Ford Museum, were considered in their entirety.

**Books and Reports:** Books and government reports provide a longer-form account of popular story-lines, and can be very revealing when some facts about their authors are taken into account. Books can be critical cases, indicating the wide appeal of some story-lines by demonstrating that they were supported even by actors who would have been predisposed to reject them. They can also provide extreme cases, illustrating the story-lines seen as most appealing by actors with very clear agendas. Government reports are a useful illustration of the story-lines that were used to increase the public acceptability of policy programmes. Books and reports were chosen primarily by reference from primary sources. This selection methodology has not provided a representative survey of all the books that were published on a topic within any given time period, but does allow the use of books that are interesting when considered on their own. The newspapers and magazines used for this thesis were analysed using a sampling approach, in which each document was searched at chronological intervals for articles expressing an opinion on road or rail transport. Each article was then read in detail to identify important topics, themes, narratives, and story-lines, and tagged according to these discursive elements. An account of the dominant story-lines at different points during each transition was compiled by observing which story-lines occurred the most frequently. Story-lines voiced by prominent actors, such as political leaders or newspaper editors, were also given extra consideration, and so salient facts indicating the position of actors promoting different story-lines are noted in the empirical chapters. The most important story-lines identified by this approach were considered in light of other developments in the transition, which were found through secondary historical research, in order to determine which kinds of story-lines were most popular during different phases of the transition.

The detailed qualitative approach outlined above is crucial for a detailed understanding of the story-lines occurring in different sources, taking into account things such as the actors promoting different story-lines and the nuances of the language or imagery that they use. It is, however, open to selection bias. In order to guard against this, a quantitative method of analysis has also been applied to the newspaper sources. Newspapers have been chosen for this method because of the ease of conducting rigorous keyword searches in digital newspaper databases. Three newspapers in the United Kingdom and five in the United States were subjected to a keyword search for opinion articles whose titles contain keywords relating to road and rail transport in different time periods across the transition.
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The emphasis on opinion articles with the keywords occurring in their titles rather than their body text was chosen so that it would reveal articles which express an opinion on transport controversies rather than merely describing events, and which give detailed consideration to the issues reflected in the keywords, rather than mentioning them incidentally.

The goal of this quantitative survey was to survey approximately 100 articles for both rail and road transport in each time period in each country. The top thirty articles in three of the British newspapers as ranked for relevance by the search algorithm were reviewed, while in the United States, the top twenty articles in five of the newspapers were considered. In some cases the topic being surveyed was so marginal that the total number of articles fitting the search criteria was smaller than this quota, forcing a smaller sample size. Due to technical issues related to the problem of computer recognition of old typefaces,170 each of the articles retrieved through these searches was read in its entirety. Every time a new theme or story-line was identified during this analysis, it was added to a spreadsheet, which tallied the total number of times that it came up during the survey.

The findings of this quantitative analysis have been presented in tables throughout chapters 4 and 5, which list the results of the quantitative analysis for either road or rail transport for a specific time period. Each table lists the newspapers that were surveyed in each country on the horizontal axis, accompanying each with a number in parentheses which identifies the number of articles surveyed for that publication. The themes or story-lines that were found in the analysis are arranged along the vertical axis. For each story-line, a decimal indicates the proportion of articles in each newspaper in which it appeared, as well as its occurrence in all the newspapers taken together. Only story-lines that were found in at least one tenth of the coverage of at least one newspaper were included in the tables. This was a very generous criterion for inclusion, meaning that the inclusion of a story-line in the table does not necessarily indicate that it was popular. These tables are used in chapters 4 and 5 as a supplement to the qualitative analysis, illustrating the popularity of the story-lines that it identifies.

Table 3.1 provides a brief overview of the source selection, time periods, and search terms used for the quantitative analysis of newspapers. Table 3.2 provides a systematic overview of all the sources used in this thesis, outlining the rationale for their inclusion and procedures used to analyse them.

170 Strange, McNamara et al 2014.
### Table 3.1: An overview of the quantitative content analysis methodology. The newspapers surveyed reflect a smaller sample than those surveyed for the more qualitative analysis, because the quantitative analysis requires access to online databases which can be searched in a consistent way. In each case, the four phases have been broken up into a larger number of time periods, some of which required new keywords to reflect changing language used to refer to road and rail transport.

<table>
<thead>
<tr>
<th>Period 1: Radical Novelty</th>
<th>Railway Keywords</th>
<th>Road Keywords</th>
<th>Years Surveyed</th>
<th>Railway Keywords</th>
<th>Road Keywords</th>
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<td></td>
<td>&quot;railway&quot;, or &quot;train&quot;</td>
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<th>Years Surveyed</th>
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<th>Road Keywords</th>
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<td></td>
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<td>&quot;automobile&quot;, &quot;motor car&quot;, &quot;motor bus&quot;, or &quot;roads&quot;</td>
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<td>&quot;railway&quot;, or &quot;train&quot;</td>
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<td>Selection Rationale</td>
<td>UK Case-Study</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------------</td>
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| **Newspaper Editorial Content** | • Newspapers provide a forum for general public debate, involving both prominent columnists, and anonymous members of the public.  
• Newspapers were chosen for popularity, longevity, diversity of viewpoints, and for ease of access.  
• Newspapers were sourced from the proquest newspaper database (http://search.proquest.com/news), the gale newspaper database (find.galegroup.com), and ukpressonline.com | The Guardian  
The Observer  
The Times of London  
The Daily Mail  
The Daily Mirror  
The Daily Express | The New York Times  
The Los Angeles Times  
The Baltimore Sun  
The Chicago Tribune  
The Boston Globe  
The Washington Post  
The Wall Street Journal | • Newspapers in an online database were searched at 3 or 5 year intervals, with each search covering all editorial articles, opinion columns, or letters to the editor occurring in a given year.  
• Searches were conducted for editorial content containing the search terms “railway” (“railroad” in the USA), “train”, “automobile”, “motor-car”, “motor-bus”, “highway”, or “motorway” (“interstate” in the USA), as well as terms relevant to prominent transport controversies occurring at particular points in time. |
| **Political Speeches and Debates** | • Politicians attempt to appeal to public sentiment in speeches and in legislative debates.  
• Speeches were chosen for relevance to transport issues, as well as for availability. | Parliamentary speeches were found in the database at hansard.milibanksystems.com  
Some speeches by Prime Ministers or cabinet ministers were found in newspapers, or online repositories. | Congressional debates were found in hard copies of the United States Congressional Record.  
Presidential speeches were sourced from the Miller Center’s Online Presidential Speech Archive. (http://millercenter.org/president/speeches) | • Searches of the British Parliamentary Hansard were conducted for keywords referring to transport technologies or specific controversies, while debates over important pieces of transport legislation were read in detail.  
• Debates over transport-related bills in the Congressional Record were manually searched for relevant quotations.  
• British Prime-Ministerial speeches from moments of controversy over transport were sought out in newspapers and online archives.  
• Archived presidential speeches were searched for transport-related keywords. |
<table>
<thead>
<tr>
<th>Type of Source</th>
<th>Selection Rationale</th>
<th>UK Case-Study</th>
<th>USA Case-Study</th>
<th>Sampling Procedure</th>
</tr>
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<tr>
<td>Government Documents</td>
<td>• Government documents attempt to make their proposals publicly acceptable by locating them in relation to popular story-lines.</td>
<td>The Reshaping of British Railways (1963)</td>
<td>No American government reports were used. Due to the large role of states in the regulation of American transport, there were no examples of reports which had a major national public resonance.</td>
<td>• Reports and books were read in detail, or sometimes only for their most relevant sections. Relevant quotes were noted down.</td>
</tr>
<tr>
<td></td>
<td>• Government documents were mainly sought out based on references in secondary historical literature.</td>
<td>Traffic in Towns (1963)</td>
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<tr>
<td></td>
<td>•</td>
<td>How do You Want to Live (1972)</td>
<td></td>
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<td></td>
<td>•</td>
<td>Railway Finances (1982)</td>
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<td>•</td>
<td>A New Deal for Transport (1998)</td>
<td></td>
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<tr>
<td></td>
<td>•</td>
<td>Transport 2010 (2000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Books</td>
<td>• Non-fiction books present story-lines about transport in long-form and, if popular, illustrate in detail the views and arguments that many people were exposed to.</td>
<td>Alker Tripp: Road Traffic and Its Control (1938)</td>
<td>Jesse Hardesty: The Mother of Trusts: The Railroads and their Relation to the Man with the Plough (1899)</td>
<td></td>
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<tr>
<td></td>
<td>• Fiction books illustrate cultural understandings of the lived experience of using different transport systems.</td>
<td>George Orwell: The Road to Wigan Pier (1937)</td>
<td>Jane Jacobs: The Death and Life of Great American Cities, (1961)</td>
<td></td>
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<tr>
<td></td>
<td>• Books were sought by reference from secondary sources.</td>
<td>John Moore: Britain and the Beast (1938)</td>
<td>Ralph Nader: Unsafe at Any Speed (1965)</td>
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<tr>
<td></td>
<td></td>
<td>Road alert: Road Raging (1997)</td>
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<tr>
<td>Railway Magazines</td>
<td>• Railway magazines illustrate the story-lines directly promoted by railway actors.</td>
<td>Railway Magazine</td>
<td>Railway Gazette</td>
<td>• Magazines were searched at 5-year intervals, as well as during years when prominent controversies or policy decisions occurred. Each year, the editorial page of the first issue of each month was read, and relevant quotes were recorded.</td>
</tr>
<tr>
<td></td>
<td>• Railway magazines were chosen for longevity, size of readership, and availability.</td>
<td>Railway Gazette</td>
<td>Electric Railway Journal</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>RAIL</td>
<td>Railway Age</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Electric Railway Journal</td>
<td>Railroad Stories</td>
<td></td>
</tr>
<tr>
<td>Car Magazines</td>
<td>• Car magazines illustrate story-lines promoted by motor-transport actors.</td>
<td>Autocar</td>
<td>Car and Driver</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Car magazines were chosen for longevity, readership, and availability.</td>
<td>The Motor</td>
<td>Michigan Motor News</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Car Magazine</td>
<td>Motor</td>
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<tr>
<td></td>
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<td>Top Gear</td>
<td>Motor Trend</td>
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<td>Motor World</td>
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<td></td>
<td></td>
<td></td>
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</table>
The evolution of discursive story-lines during socio-technical transitions

<table>
<thead>
<tr>
<th>Type of Source</th>
<th>Selection Rationale</th>
<th>UK Case-Study</th>
<th>USA Case-Study</th>
<th>Sampling Procedure</th>
</tr>
</thead>
</table>
| Railway Advertisements | • Railway advertisements show how railway actors relate to the general public.  
                          | • Advertisements were mainly considered based on availability.                      | • Advertisements found in the National Railway Museum’s online collection.                  | No source of American railway advertisements was available.          | • The National Railway museum’s collection of railway posters was considered in its entirety.          |
| Car Advertisements   | • Car advertisements show how car actors relate to the general public.  
                          | • Advertisements were mainly considered based on availability.                      | • Advertisements were photographed while searching British car magazines for editorial content. | One advertisement was photographed from each issue of each car magazine that was surveyed.  |
|                       |                                                                                     |                                                                                                 | • Advertisements were photographed while searching American car magazines for editorial content,  
                          |                                                                                     |                                                                                                 | while some others were found in the archives at the Henry Ford Centre in Dearborn, Michigan.         |
|                       |                                                                                     |                                                                                                 | • All of the advertisements in the Henry Ford Centre archive were photographed.            |
|                       |                                                                                     |                                                                                                 | • Advertisements from each country were ordered by year, and the most obvious trends were identified for each decade. |

Table 3.2: An overview of all the sources used in the case studies.
Chapter 4:  British Case Study

4.1. Introduction

This chapter discusses the development of story-lines during the transition from a rail-dominated transport system to a road-dominated transport system in the United Kingdom. This began with the early development of cars before the First World War, and reached a tipping point in the late 1950s and early 1960s, as private cars surpassed railways and buses to become the overwhelmingly dominant mode of transport (Figure 4.1). This history is broken up into four periods, corresponding to the four phases of the analytical model. These periods are listed below:

Figure 4.1: British surface passenger transport, 1890-2010. Data from Fouquet, 2012.

Period 1: Radical Novelty (1896-1918). This period begins with the passage of the 1896 Locomotives on Highways Act, which removed restrictions on the use of cars on British roads, thereby establishing them as a viable means of utilitarian transport that could potentially compete with the railways. During this period, cars remained mostly confined to an upper-class recreational niche, and had not yet acquired any of the dedicated infrastructure or societal embedding necessary to

\[171\] Flink 1988, p. 21
become an entrenched regime. Railways therefore remained the dominant means of transport during this period.

**Period 2: Stabilization (1918-1945).** After the First World War, cars became more popular on British roads, and buses began to pose a threat to the railways, which were struggling due to economic turbulence and restrictive regulations. The increasing numbers of cars created problems, including accidents and congestion. The response to these problems was often to support the motor niche by creating road infrastructure and traffic laws. These changes began to establish road transport as a regime in its own right.

**Period 3: Contestation and Overthrow (1945-1963).** By the end of the Second World War, road transport had become sufficiently entrenched to challenge the railways directly. This led to a conflict over infrastructure, which road transport won between 1962 and 1963, when the government decided on dramatic cuts to the railway network while redoubling investment in motorway construction. This decision cemented the transition from a rail regime to a road regime.

**Period 4: Regime Maintenance (1963-2001).** After it became the dominant regime in 1963, road transport contended with new and ongoing problems such as pollution, congestion, and protests against motorways. Meanwhile, the railways stagnated and struggled to attract traffic throughout the 1970s and 1980s. The years between 1990 and 2001, though they are part of this period, have been presented in a separate “epilogue” section, because during this time, the problems with the car regime had begun to lead to substantive challenges to it, including protest movements, new policy agendas, and rejuvenated support for rail travel. These challenges lost momentum around 2001, when the narrative of this case-study ends.

Each section in this chapter has five parts. An introduction provides a basic background to the major developments in rail and road transport during the period in question, and outlines the predominant story-lines about road and rail transport which occurred during the period. Next, a brief outline of the cultural landscape uses secondary historical sources to discuss important social changes which provided a macro-cultural context for discursive struggles during the period. Because it is not possible to provide a thorough overview of all the cultural and political developments in each period in such a short space, each cultural landscape section emphasizes the developments in the cultural landscape that are most relevant for the story-lines occurring in that period. The next two sections provide separate
accounts of the development of story-lines pertaining to road and rail transport during the period. Within each of these subsections, subheadings are provided to demarcate discussions of positive story-lines, negative story-lines, and defensive story-lines promoted to counter the negative story-lines. Finally, a concluding section for each section discusses the theoretical implications of the developments observed in that period.
The evolution of discursive story-lines during socio-technical transitions

4.2. Period I: Radical Novelty (1896-1918)

4.2.1. Introduction

Road transport remained insignificant during this period, only gaining some modest popularity after about 1905. This left railways as the dominant means of passenger transport prior to the First World War (Figure 4.2). During the final decades of the nineteenth century, legislation mandating cheap third-class rail fares had made railway travel accessible across the British social spectrum. At the same time, railway companies had been amalgamating since the early 1870s. This became a significant public concern towards the end of the nineteenth century: In 1872, a series of proposed amalgamations led to the creation of a joint select committee to study the problem, and eventually to a Railway and Canal commission charged with reviewing proposed amalgamations. Railway companies compensated by coming up with pooling and receipt-sharing arrangements, however, and by 1911, Parliament had formally agreed with the Board of Trade Committee’s findings that competition in the railway sector was becoming a thing of the past.

Figure 4.2: British surface passenger transport, 1865-1919. Data from Fouquet, 2012.

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Motor transport remained legally and commercially marginal throughout most of this period. The 1865 Locomotives on Highways Act, which required all cars to be preceded by a person on foot with a red flag, made motor transport legally impractical on British roads until the red flag provision was repealed by a new Locomotives on Highways Act, passed in 1896. The Motor Car Act of 1903 further legitimated cars on British roads by establishing some of the country’s first licensing and traffic laws. This allowed motor vehicles to develop two market niches, as upper-class recreational vehicles and as the first buses. The Development and Road Improvement Fund Act of 1909 established dedicated funds for road improvement, although it is notable that a provision to build car-only motorways was rejected for fear that it would lead to the exclusion of cars from ordinary roads. This demonstrates that even car advocates were not yet committed to the idea of a national motor transport infrastructure, and were much more concerned with the possibility that motor transport could be intentionally marginalized by a hostile public.

The predominant struggle for railway actors during this period was not with road competition, but with passengers and shippers who were angry about the costs and quality of service offered by the railways. Railway critics’ story-lines blamed these problems on amalgamation and greedy railway managements, and railway managers responded by asserting their authority as technical experts. Motor interests, meanwhile, were engaged in a struggle with critics who portrayed cars as impractical and dangerous. Motor transport advocates responded by promoting visions of a future in which a fast, efficient and safe motorized transport system would be available to the entire British population.

4.2.2. The Cultural Landscape

By the end of the nineteenth century, Britain’s status as a dominant industrial power appeared increasingly under threat, as other countries such as Germany and the United States became more economically competitive. This prompted anxieties over whether Britain could maintain its economic dominance in the long-term, as well as a desire to encourage technological innovation. This would create more space for story-lines around the car which emphasized it as a symbol of economic progress. This was somewhat offset, however, by the increasing intensity of class conflict in Edwardian Britain. The trade union movement had politicized the working classes, while the upper classes began to

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175 Bagwell 1988 pp. 138-139
179 Pugh 1999, p. 27
180 Pugh 1999, p. 153
The evolution of discursive story-lines during socio-technical transitions attract more political criticism: Leader of the Opposition Joseph Chamberlain derided them as people “who toil not, neither do they spin.”¹⁸¹ The early automobile, a technology only accessible to the richest, was a target for criticism in this political and social climate.

4.2.3. The Railways’ Discursive Dominance

Positive Story-Lines

Positive story-lines about the railways during this period portrayed them as a stable and reliable system which would be the default form of intercity transport for the foreseeable future, even if it was not particularly exciting. Railway advertising from this period often depicted destinations rather than trains, apparently taking for-granted that travellers would use railways to reach those destinations (Figure 4.3). This assumption was also reflected in discussions about the future of transport, which was commonly assumed to involve new kinds of railways, involving electric traction, high-tech steam locomotives, or undersea tunnels to France or Ireland,¹⁸² rather any radically new transport system based on motor vehicles or any other new technology. While these predictions did not occur frequently enough in the mainstream press to show up in the quantitative content analysis (Table 4.1), newspapers did occasionally discuss them in very romantic terms. A Manchester Guardian editorial published in 1906, for example, predicted that “By Channel Tunnel train we shall go through the chalk on which the wolf and bear walked dry-shod into Britain, and take our August holiday in Switzerland.”¹⁸³ A 1900 editorial in The Times predicted that electric railways would provide “the ample accommodation, the spacious lifts, the pure air, the uniform temperature, the convenient stopping places, the good light, and the rapid movement” necessary to make rail travel far more pleasant.¹⁸⁴ These visions of the railway future were criticized as often as they were endorsed, but it was nevertheless widely assumed in the mainstream press that the future of transport would be on the rails.

¹⁸¹ Pugh 1999, p. 29; Mason 1994, p. 113
¹⁸³ The Manchester Guardian., 1906, No title. 28 April, p. 8.
¹⁸⁴ The Times, 1900, No title. 29 August, p. 7.
Apart from a few dramatic visions of the motorized future that will be discussed in section 4.2.4, motor vehicles were not widely portrayed as a challenge to the railways. The quantitative analysis of newspaper commentary about the railways does not illustrate any widespread view that road transport could compete with the railways. In the rare cases where railway magazines mentioned motor vehicles, it was sometimes in very positive terms. A 1912 *Railway Gazette* article about the Good Roads movement in the United States, for example, praised the development of “good feeder roads”, suggesting that the main goal of road development was to bring traffic to the nearest railway station.\(^{185}\)

The evolution of discursive story-lines during socio-technical transitions

<table>
<thead>
<tr>
<th></th>
<th>The Guardian (31)</th>
<th>The Times (30)</th>
<th>The Daily Mail (30)</th>
<th>All newspapers (91)</th>
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<td>Accidents</td>
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<td>0.08</td>
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<td>Labour Issues</td>
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<td>0.1</td>
<td>0.05</td>
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</table>

Table 4.1: The results of a quantitative content analysis of newspaper opinion articles about railways from 1896 to 1918.

Negative Story-Lines

The most widespread story-lines about the railways during this period were negative. Accidents were the most common topic in newspaper editorials about railways: Nearly half of all the Daily Mail's commentary on railways mentioned accidents; suggesting that railway crashes were seen to have a very high degree of the emotional resonance, a quality which the Daily Mail sought to cultivate in its coverage and commentary (Table 4.1). While many articles about accidents offered helpful suggestions for ways to make the railways safer, 16 percent of the articles surveyed interpreted railway disasters as evidence of fundamentally unsafe railway practices. One Times correspondent, referencing an incident in which a train’s communicator had failed during an emergency, complained that “It is surely a scandalous thing that, after half a century of railway traveling, such a simple but important precaution as that of a communicator should be neglected, and that at this advanced day one of the fears of the first timid opponents of the railways should be justified.”

Poor-quality service was also popular in coverage of the railways during this period, accounting for nearly a quarter of the articles surveyed for the quantitative analysis. This was particularly common in the Times, where letters to the editor complained of bad scheduling, unpunctuality, and bad on-board amenities. These were often combined with

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186 Williams 2009, p. 28
188 Rowe, J.C., 1897, ‘Railway Alarm Communicators’, The Times. 7 June, p. 15.
the aforementioned safety complaints to promote a broader anti-railway story-line portraying railway managers as either inept, or as greedy and monopolistic. This was particularly common in the Daily Mail, as the railways, with all the frustrations they caused, presented a tempting target for the Mail’s brand of commercial crusading. On two occasions in 1900, the Mail published an entire page of correspondents’ complaints about the railways, on both occasions giving the feature a title calling the railways “slothful”. An editorial comment on one of these pages blamed the problems on amalgamation, which it claimed “has been a curse and not a blessing for those dependent on these lines as their only means of travelling”. Another correspondent described the railways’ practice of charging extra for luggage as “an unreasonable exercise of extreme powers possessed by these powerful monopolist corporations”. In 1900, a lengthy Times editorial arguing that the British railway system had lost its status as the best in the world elicited several letters to the editor recounting correspondents’ worst experiences on the railways. A 1908 letter to the editor of The Manchester Guardian worried that amalgamation would bring about “a state of affairs...in which the interests of the nation and those of the railway proprietors may come into sharp conflict”.

Defensive Story-Lines

Railway actors’ defensive story-lines in the face of this criticism do not show up at all in the quantitative analysis of mainstream journalism, but the response evident in the Railway Gazette’s editorial column illustrates that they mainly relied on railway actors’ technical authority. In 1907, the editor of the magazine cited “the extraordinary attitude occasionally taken up by the man in the street with regard to railways and railway working, an attitude which finds its most superb expression in the naive comments of local newspapers” as “proof of the dangers run by non-experts in dealing with technical subjects beyond their ken.” The same editor also condemned anti-railway legislators, whose actions he described as being influenced more by a fickle public opinion than any sophisticated

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192 Ibid.
The evolution of discursive story-lines during socio-technical transitions

understanding of the problems of running a railway. To address these unfair criticisms, the Gazette recommended that railway companies could do more to correct what it described as “misunderstandings” about the railway industry. These articles emphasize the complexity of the railway system and the competence of those who run it, dismissing criticisms as the product of an ill-informed public. Faced with a negative story-line portraying railway actors as greedy and incompetent that enjoyed empirical credibility from coverage of accidents, and experiential commensurability from complaints about bad service, supporters of the railways retreated to the safe territory of empirical and actor credibility to portray their system as too complicated for outsiders to fairly criticize.

4.2.4. The Legitimation of Motor Transport

Positive Story-Lines

The dominant positive story-line about motor transport during this period portrayed cars as an exciting and modern technology which could have great potential if only its present-day usage was not so heavily restricted (Table 4.2). Among drivers and car manufacturers, the emphasis in positive story-lines was often placed on excitement: These groups often understood cars primarily as engineering artefacts or luxury recreational machines. Car advertisements during this period were highly technical, making extensive use of cross-sectional drawings and technical descriptions, and rarely if ever showing the cars actually being driven (Figure 4.4). Newspaper Coverage of the British International Motor show was similar. One description of a self-starter, for example, ignored its implications for the comfort and convenience of motoring in favour of a highly technical description of how it worked:

Two sizes of this starter are marketed. One called Model “B” is capable of turning over a 60-h.p., c-cylinder engine at 80 revolutions per-minute, for which operation less than 600 watts are necessary. It will, of course, revolve a smaller 4-cylinder engine considerably faster. Model “A” is designed for engines of a larger size or of a higher compression. The makers claim that owing to the unusual efficiency of this model 75 per cent of the energy drawn from the batteries is applied to the fly-wheel and that owing to the absence of gearing, a battery 30 per cent smaller than usual can be employed.

199 Prioleau, J., 1913, ‘Motor Show’. The Daily Mail. 7 November, p. 3.
This emphasis on cars as technical artefacts suggests an intended audience with a high degree of mechanical literacy, likely made up of hobbyists and enthusiasts who were as interested in how the technology works as they were in its potential uses. Car journalists also typically aimed their writing at an upper-class audience, with newspaper and car journal articles comparing cars to fine wines, or discussed the inconvenience of having to make one's servants ride on the footboards when travelling with company.  

Figure 4.4: Some examples of early twentieth-century British car advertisements. Note the emphasis on technical details and performance trials.


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The evolution of discursive story-lines during socio-technical transitions

<table>
<thead>
<tr>
<th></th>
<th>The Guardian (22)</th>
<th>The Times (30)</th>
<th>The Daily Mail (30)</th>
<th>All Newspapers (82)</th>
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<td>0.18</td>
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<td>0.17</td>
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<tr>
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<td>0.20</td>
<td>0.10</td>
<td>0.15</td>
</tr>
<tr>
<td>Motoring portrayed as a form of liberty.</td>
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<td>0.13</td>
<td>0.13</td>
<td>0.13</td>
</tr>
<tr>
<td>Cars portrayed as safe.</td>
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<td>Motorists portrayed as gentlemen.</td>
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<td>0.20</td>
<td>0.03</td>
<td>0.10</td>
</tr>
<tr>
<td>Concerns about frightened horses.</td>
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<td>0.20</td>
<td>0.07</td>
<td>0.10</td>
</tr>
<tr>
<td>Motorists portrayed as reckless.</td>
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<td>0.07</td>
<td>0.07</td>
<td>0.09</td>
</tr>
<tr>
<td>Horses will get used to cars.</td>
<td>0.00</td>
<td>0.17</td>
<td>0.03</td>
<td>0.07</td>
</tr>
<tr>
<td>Support for speed limits</td>
<td>0.00</td>
<td>0.00</td>
<td>0.10</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Table 4.2: The results of a quantitative content analysis of newspaper opinion articles about motor vehicles from 1896 to 1918.

There were some attempts at crafting story-lines of wider appeal. 17 percent of all the newspaper articles surveyed for the quantitative analysis portrayed cars as emblems of technological and social progress (Table 4.2). The editorial in the first issue of *Autocar* described automobiles as “the latest production of the ingenuity of man”, and the latest development in a progression of transport technologies, stretching from bicycles and horse-drawn carriages to internal combustion engines.201 Some car advocates promoted visions of a future in which cars had become the dominant mode of transport. As early as June 1896, the *London Daily News* predicted the total replacement of horses by motor vehicles.202 When the Locomotives on Highways Act passed in 1896, *Autocar* proposed cars as a future alternative to both horses and light railways, predicting that

The whole country can be threaded with a network of the equivalent of light railways without the need of destroying the roadways with expensive rails; and it means, perhaps more than anything else, that rural districts will be readily connected to towns with a minimum of expense.203

These visions were often complemented by ambitious proposals for future road infrastructure. In 1899, John Scott Montagu proposed a dedicated motor road from London to Brighton.204 Montagu was probably the most aggressive supporter of the early British automobile. An avid sportsman, he became a fanatical supporter of motor

202 Jeremiah 2007, p. 16; Flink 1988, p. 27.
203 Ibid.
204 Jeremiah 2007, p. 18.
transport: He was the editor of *The Car*, and had taken the King for his first ride in a car in 1902.\textsuperscript{205} Montagu’s comments therefore reveal the story-lines most appealing to the early car’s most dedicated supporters, rather than any more widespread views, but there were other actors who supported Montagu’s vision. In 1908, *The Motor* proposed a broad motor highway running through London, (Figure 4.5) while soon-to-be Prime Minister Arthur Balfour supported a similar vision a year later.\textsuperscript{206} Car magazines and car clubs periodically promoted their own versions of future motorways throughout this period,\textsuperscript{207} though, as previously mentioned, in 1909 car advocates rejected proposals to actually build them, out of fear that this would lead to the exclusion of motor vehicles from other roads.\textsuperscript{208} These visions were rarely taken seriously by those who were not strong supporters of motor transport, however. Support for measures to better accommodate cars, or suggestions that cars might one day compete with trains, were not a significant occurrence in newspaper coverage from this period (Table 4.2). In 1896, when Henry Chaplin proposed in parliament that cars might compete with railways in rural areas, other parliamentarians laughed at him.\textsuperscript{209} Cars did not have enough empirical credibility as a practical technology for these visions to be taken seriously during this period.

\begin{figure}
\centering
\includegraphics[width=\textwidth]{figure4.5.png}
\caption{The Motor's ambitious vision of a "utopian" motor road through London.}
\end{figure}


\textsuperscript{205} Jeremiah 2007, p. 19.
\textsuperscript{206} Merriman 2007, p. 25.
\textsuperscript{207} Jeremiah 2007
\textsuperscript{208} Merriman 2007, p. 26; Bagwell 1988, p. 208.
\textsuperscript{209} HC Deb 30 June 1896 vol 42 col 440.
The evolution of discursive story-lines during socio-technical transitions

Negative Story-Lines

Negative story-lines about motor vehicles during this period presented them as noisy, impractical, and dangerous nuisances. Accidents were the most common topic in opinion journalism about cars, with 17 percent of all the articles surveyed supporting restrictions on cars and their drivers, including speed governors, speed limits, and even jail time for dangerous driving (Table 4.2). Another prominent concern was the tendency of cars to frighten horses, though car advocates often answered this by predicting that that horses would eventually get used to cars. These story-lines appear in a marginal role as car advocates sought basic legitimacy during the debates over the 1896 Locomotives on Highways Act, and over the 1903 Motor Vehicle Act. While the 1896 Act received little substantive criticism, and was most often understood as a common-sense adaptation to technological progress (the editor of The Guardian called it a “Modest little measure”210), it did arouse some opposition. One correspondent in The Times criticized the lack of speed limits in the bill, and suggested that the government “wait and see whether enough of the public are killed or wounded to compel them to take action”.211 The bill’s biggest critic in parliament was Dr. Tanner of Cork County, who complained that “In all the places where [cars] had been introduced they were absolutely found to have become a nuisance.”212 James Daly, another Irish MP, expressed concern about the effect of cars on Ireland’s horse breeding industry,213 and the inability of the government to effectively enforce license fees.214 Neither Tanner nor Daly was a prominent politician, however: Both were members of a short-lived splinter group which had diverged from the Irish National party over a religious dispute. Daly was insignificant enough that his resignation in 1902 received no meaningful coverage in The Times,215 while Tanner’s obituary tellingly noted that “There is all the difference in the world between notoriety and success.”216 Tanner and Daly’s quotations therefore illustrate only that anti-car story-lines were present in parliamentary debate; not that they were dominant.

212 HC Deb 30 June 1896 vol 42 col 440-441.
213 HC Deb 30 June 1896 vol 42 col 444.
214 Ibid.
216 The Times, 1901, ‘Obituary-Dr. Tanner, M.P’, 23 April, p. 10.
After 1896, partly due to the occurrence of the country’s first fatal car accident that year, deaths and injuries on the roads began to capture more media attention. In 1903, the editor of *The Manchester Guardian* argued that “under the present conditions of the road, it is impossible to blame the parents of the children or owners of the dogs” for car accidents that might befall their charges. *The Times* published letters and editorials about “the motor problem”, which the editor judged “hardly can be solved, so long as the present laws remain unchanged”. In 1903, as parliamentarians were debating the Motor Car Act, the *Daily Express* described three prevailing opinions about motoring:

There are the people who hate motor-cars, and think any legislation short of the summary punishment of any man or woman found in the possession of one a travesty of justice; there are the people who would like to have motor-cars but cannot afford them, and envy the fortunate owners; and there are the owners themselves, who have long ago come to the conclusion that the possession of a motor-car is not all that the fancy of the novice paints it.

In the parliamentary debates over the Act, Orkney and Shetland MP Cathcart Wason was bitterly anti-car, complaining that “Harmless men, women, and children, dogs, and cattle, had all got to fly for their lives at the bidding of one of these slaughtering, stinking engines of iniquity.” Sir Henry Meysey-Thompson expressed more moderate concerns about the rights of horse-drawn carriage owners’ “to use the roads in decent comfort and safety”. Wason and Thompson, both members of the governing Liberal party, may have been reflecting that party’s growing tendency to promote the public interest at the expense of private interests, which certainly would have included those of car owners. But even Lord Lamington, a Conservative who was sufficiently pro-car to predict the development of motorways in the future, opened a debate over the 1903 act by describing motoring as “merely a branch of sport indulged in on the public roads at considerable risk to the public”. The relatively pro-motorist *Daily Mail* reported a changing public opinion concerning cars, noting that “the mere mention of the word ‘motor’ or ‘motorist’ is enough

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217 Jeremiah 2007, p. 53.
220 *The Times*, 1902, No title. 23 September, p. 7.
222 HC Deb 11 June 1903 vol 123 col 698.
223 HC Deb 11 June 1903 vol 123 col 702.
224 Pugh 1999, p. 136
225 HL Deb 30 April 1903 vol 121 col 926-8.
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to make most members of the House actually, and not figuratively, inarticulate with emotion”, and that such people saw cars as “an invention of the evil one.”

These complaints were easy to frame in class terms, with critics portraying car accidents as a physical attack by the upper classes on the working and middle classes. This embroiled motorists and car manufacturers in class conflict. In 1903, R. G. Duff of the Local Government Board observed an “embittered feeling in the general public against all persons who use motors, which, as a dangerous class feeling, is perhaps without parallel in modern times.”

1902 saw the formation of the Pedestrians’ Protection League; a lobby group responding to the increasing dangers posed by cars. This organisation, which was later renamed the Highway Protection League, frequently cast the problems of dust and car accidents in class terms. In a 1908 meeting of, the Chairman of the League complained that “The wealthy get a little more pleasure, but pedestrians get all the annoyance,” and the following year, the Chairman wrote a letter to the editor of the Manchester Guardian protesting “against a proposal to sacrifice the comfort and safety of a vast majority to the caprice of a very small though wealthy and powerful minority”.

In July 1903, W.B. Woodgate published The Motor and the Birthright of the Highway, which framed accidents in class terms and claimed roads as the right of pedestrians. In 1905, the editor of The Manchester Guardian complained that the roads were becoming “mere racing tracks for the wealthy.” This class framing had considerable narrative fidelity given the prominence of class conflict in the cultural landscape of this period.

Defensive Story-Lines

Car proponents’ first response to these negative story-lines was to claim that they were being oppressed, and that their oppressors were impeding technological progress. Associations of cars with liberty, and of traffic laws with oppression, were common in newspaper coverage from this period (Table 4.2). In 1896, Autocar complained bitterly that “innovation and enterprise are throttled at their birth in this land of so-called freedom.”

This story-line is also evident in Henry J. Lawson’s choice of the phrase “Emancipation

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228 The Daily Mail, 1903, ‘Mr. Long Explains why It Ought to Be Abolished’, 25 July, p. 3.
229 Jeremiah 2007, p. 55
Day Run,” to refer to his motor car club’s celebratory London to Brighton trip after the passage of the Locomotives on Highways Act. A 1903 letter in The Daily Mail complained about the undue influence of “a few country folk who do not realise that the world is progressing”.235

Defensive story-lines responding to the class-based criticisms of cars attempted to erase the upper-class associations of motor vehicles, in order to avoid the problems of being portrayed as an upper-class technology, as described by historian Sean O’Connell.236 This was done using visions of cars that were affordable to people outside of the upper classes. Towards the middle of the 1910s, motor journals and correspondents began to promote a new vision of more affordable cars, citing some of the cheapest cars as evidence of falling prices.237 In its coverage of the 1908 London motor show, for example, the Daily Mail predicted “a great revolution in prices”.238 Cars would not be widely affordable outside the upper classes until after the First World War,239 but the vision of the affordable car could nevertheless have been an important rhetorical asset, allowing car proponents to symbolically extend the identity of “driver” across British society.240 This is an excellent example of the role that a vision of the future can have in developing support for a niche technology, by diverting attention from the problems of the present, and fitting the niche technology better into the cultural landscape.

4.2.5. Conclusion

To interpret this period, it is important to notice the struggles that did not occur. Railway actors did not make any attempt to challenge the emerging motor niche, while motor niche actors made no attempt to position themselves as a viable replacement for the railways. Proponents of cars and trains did not engage directly with one-another because there was no empirically credible story-line positioning cars as a viable means of intercity transport. This may also explain why there were no significant positive story-lines about railways as a technology during this period. Railway advertising focused on destinations, while assessments of new railway technologies were sober and technical, and the Railway Gazette was fairly complacent when engaging with anti-rail story-lines. All of this was due to the fact that the railways were the only system with any claim to empirical credibility. Negative story-lines, drawing experiential commensurability from frustrations over fares and service quality,

236 O’Connell 1998.
239 O’Connell 1998, p. 19
240 O’Connell 1998, pp. 120-122.
The evolution of discursive story-lines during socio-technical transitions were unable to pose any significant threat to the rail regime, regardless of how resonant they became.

During this period, motor transport actors had very limited discursive resources with which to construct legitimacy and attract support. Cars had little empirical credibility as a form of transport, and their upper-class supporters lost actor credibility due to the class conflict prevalent during this period, and positive experiences of driving were not apparent beyond a small community of recreational motorists. Motor transport actors therefore developed narrative fidelity by appealing to visions of a future in which useful, affordable cars ran along tidy and efficient motorways. This was necessary to counter negative story-lines, portraying cars as dangerous upper-class luxuries, and which gained experiential commensurability through common problems such as accidents and scared horses, as well as narrative fidelity from class conflict. Interestingly, cars’ supporters used visions of affordable cars as a defensive strategy against their critics, rather than just to attract positive support. This illustrates considerable creativity from these actors. Given the discursive challenges facing cars during this period, this creativity was probably necessary.
4.3.  Period II: Stabilization (1918-1945)

4.3.1.  Introduction

Changes in human and industrial capital in the United Kingdom during the First World War strengthened the position of British cars and, especially, buses (Figure 4.6). This caused railway actors to perceive road transport as a threat for the first time, while controversies over problems such as road accidents intensified as the number of road vehicles increased. Dramatic negative story-lines depicted cars as a public danger and a threat to the British countryside. Motor transport advocates responded very cleverly to this, using these problems to craft story-lines justifying infrastructural and societal changes to avert these problems by better accommodating motor vehicles on British roads. This advocacy proved successful in 1937, when the government assumed control of 4,500 miles of trunk roads in order to make them more suitable for motor vehicles.

![Figure 4.6: British passenger transport, 1919-1945. Data from Fouquet, 2012.](image)

During this period, the railways, suffered from the effects of the war and the trade depression of 1921, as well as competition from the roads. Railway actors began developing positive story-lines portraying the railways as a safer and more dependable transport system than motor transport. Railway actors were also engaged in a struggle over

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243 Dyos and Aldcroft 1971, p. 369.
regulation. The railways had been placed under government control during the war, and their return to private hands in 1920 occurred only after a major political controversy, in which proposals for a permanently nationalized railway network were common. Ultimately, the 1920 'Transport Act divided the railways into seven regions, and led to the creation of the 'big four' railway companies: Large, government-sanctioned and heavily-regulated regional monopolies. The Railway Act of 1921 created a Rates Tribunal, which placed restrictions on railway companies’ abilities to set their rates, and the railways were banned from using motor vehicles between 1922 and 1928. Facing both commercial and regulatory pressures, railway actors tried to campaign for these restrictions to be relaxed, promoting story-lines in which they were victims of an over-zealous bureaucracy which posed a threat to the prospect of a coordinated transport system. Railway critics, meanwhile, promoted a negative story-line which portrayed the railways as a dying regime that was experiencing its just comeuppance from an increasingly popular motor transport system, but which in an act of desperation might use its political influence to suppress motor transport and re-establish an abusive monopoly

4.3.2. The Cultural Landscape

An important element of the cultural landscape during this period was the increasing enthusiasm for the British countryside as a source of national identity. The countryside became an important subject of British art, while, according to historian Joseph Boughey, many writers during this period “depicted a rural idyll under threat from various modernising forces”. Conservative and patriotic narratives began to see Victorian materialism as a “temporary aberration in a naturally rural, simple, and slow-moving people”. The government got explicitly involved in efforts to protect the countryside when it passed conservation legislation designed to protect the countryside, such as by creating the country’s first national parks and creating a ‘green girdle’ around London. This is important because transport often exists in a state of tension with rural landscapes: it provides access to them, but cannot do so without also altering them. These concerns therefore had important implications for road transport, which became the focal point of a struggle between urbanites travelling to rural areas on holidays, and rural residents living in

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244 Harris and Godard 1997, p. 21.
245 Bagwell 1988, pp. 216, 244.
249 Mandler 2006, p. 172.
251 Barnett 2004 provides a good example of this.
these areas who became upset about the increasing numbers of cars using their main streets as thoroughfares.²⁵²

4.3.3. The Railways’ Fight for a Square Deal

Positive Story-Lines

Competition from bus services after the end of the First World War pushed railway proponents to engage with the threat of motor competition for the first time. Railway proponents promoted two story-lines positioning the railways as a safer, more reliable, and more efficient form of transport than the roads. A second story-line, which was aimed mainly at policymakers, claimed that railways, which could no longer form a monopoly on transport, were unfairly oppressed by obsolete regulations which hampered their ability to compete with road transport, and which in turn impeded the formation of a properly coordinated transport system.

Figure 4.7: Some examples of railway posters from the interwar period.


Growing concerns about the threat posed by motor transport are evident in railway posters from this period. While they retained the destination-focused approach, they also began to include slogans such as “It’s quicker by rail”, or “Travel in rail comfort”; a subtle

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Acknowledgement that an alternative to the railways now existed (Figure 4.7). Some posters, such as one advertising the “Flying Scotsman” service from London to Edinburgh, emphasized the trains themselves, depicting them as a powerful and modern technology.

One rationale given for the superiority of rail travel was safety, a story-line, which was particularly common in the Railway Gazette. In 1937, for example, the editor concluded that the disproportionate attention paid to railway accidents compared to road accidents “is hard luck, but the brighter the sword, the more noticeable any tarnish.” A 1927 letter to the editor of The Daily Mirror made a similar argument. In a parliamentary debate over road accidents, Labour MP Dr. Alfred Salter argued that “If 7,000 people were killed on the railways every year by accidents, this House would very soon intervene and take steps to prevent a recurrence of that sort of thing.” Salter, a devoted pacifist, was somewhat outside of the political mainstream, but still a well-respected member of parliament whose views would have been taken seriously. Indeed, Salter’s implication that the government should act on the issue reflects an enthusiasm for interventionism which was popular in the Labour party more generally after the end of the First World War.

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<th>The Guardian (30)</th>
<th>The Times (30)</th>
<th>The Daily Mail (29)</th>
<th>All newspapers (89)</th>
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<td>0.14</td>
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<td>0.07</td>
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<td>0.00</td>
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Table 4.3: The results of a quantitative content analysis of newspaper opinion articles about railways from 1920 to 1930.

256 HC Deb 18 February 1930 vol 235 col 1262.
258 Pugh 1999, p. 205.
Another story-line supporting the railways alleged that they were the victims of unfair and outdated regulations. This was most prominent during the railways’ 1938 “Square Deal Campaign”, in which railway companies lobbied the public and the government for relaxed regulations, on the grounds that the railways were unable to compete with the roads due to onerous government interference with their business (Figure 4.8). One newspaper advertisement published as part of the campaign complained that other forms of transport “are free to quote without restriction whatever charges are appropriate in each case. The railways alone are restricted. Why?” In December, when severe snows paralyzed road transport in much of the country, another advertisement emphasized the railways’ reliability, asking “what would happen to the nation’s vital food and fuel supplies if the RAILWAYS could not carry them, as they are doing at this very moment?”

These advertisements were virtually the only newspaper coverage given to the railways’ regulatory complaints. The story-line about over-regulated railways does not show up in the quantitative analysis of opinion journalism about the railways either during the 1920s or the 1930s (Tables 4.3 and 4.4). There was, however, some marginal support for a coordinated transport system involving both the roads and the railways; a system which would be impossible to obtain of the two did not compete on even terms. The editor of The Times, for example, complained in 1922 that the railways were over-regulated and argued that the

260 The Railway Companies’ Association, 1938, ‘To Every Member of the Public’, The Times. 30 November, p. 7.
The evolution of discursive story-lines during socio-technical transitions

The public “will be best served by the freest competition, coupled with such safeguards as will prevent the establishment of any form of monopoly.”

Even this, however, was not a common perspective.

**Negative Story-Lines**

Negative story-lines about the railways were far more common than positive ones during this period. The most popular of these portrayed the railways’ financial struggles as well-deserved comeuppance for a railway industry which had spent decades exploiting the British public. Newspaper editors frequently portrayed the railways’ plight as well-deserved. In 1921, the editor of *The Daily Mail* suggested that “improved roads and the pleasure of movement in the open are the handicap which the railways, with their high fares and stuffy carriages, will have to face in competition with the motor coach. Given a fine summer the railways will have a surprise.”

A 1920 *Guardian* editorial predicted that “Sooner or later the railways will be facing the fact that the road motor services will also have captured the regular contractors’ or season ticket holders’ traffic as well as that of the general traveller, and then perhaps they will think of reducing the fares.”

The editor of *The Daily Mirror* gleefully predicted that “The assault upon the railways will be doubled” as a result of new coach services. And the editor of *The Times* invoked a series of tropes about discomfort on the railways when it argued that “The quiet British public, weary of high charges, of discomfort, of the theory that travellers can be flung about like cattle, has sought its own remedy after the manner of our people.”

As in the previous period, this story-line was supported by complaints about railway service, which accounted for a fifth of all articles surveyed in the quantitative content analysis during the 1920s (Table 4.3). Some of these articles proposed constructive ways by which the railways could improve their service, but others simply blamed the problem on incompetent railway managers. This story-line was also supported by complaints about railway passenger fares and freight rates. Two nearly identical 1921 cartoons from the *Daily Mail* and *Daily Mirror* compare a fare increase granted by the Rates Tribunal to the activities of highwaymen (Figure 4.9), a story-line that was only tenable in the unique situation caused by the government-sanctioned ‘big four’ railways, whose fares could simultaneously be seen as the result of greedy private businesses and of a cumbersome and incompetent

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government bureaucracy. Editorials in the *Daily Mail* and the *Times* referred to the fare hike as a covert tax on travellers. While the editor of the *Manchester Guardian* was more sanguine, he predicted that road competition would force the railways to reduce their fares. It should be noted that by this point, these complaints may not have been entirely directed at private railway companies, as the Transport Act of 1920 had in the minds of many commentators implicated the Ministry of Transport in the railways’ threatened abuses. Indeed, in 1919, in response to a proposed version of the Transport Act which would have placed motor transport under the authority of a newly created Ministry of Transport which would also have been entrusted with helping the railways recover from the war, *Autocar* published a cartoon depicting a “railway octopus”, greedily grabbing up all competing forms of transport, including canal boats, cars, buses, and trucks. This was intended to imply that that the new ministry would fulfil its mandate to help the railways by actively suppressing motor vehicles (Figure 4.10). The combined distrust of government bureaucracy and railway companies’ abuses made for a powerfully critical story-line.

Figure 4.9: Two cartoons comparing railway fare increases with theft.


This view was repeated in parliament by William Joynson Hicks, an aggressive supporter of motor transport. Hicks complained that the transport act “is so fixed that private enterprise is to be forbidden on our roads if they come into competition with our railways”. In 1922, Hicks predicted that “the railway companies, with their vast organisation, their huge aggregations of capital”, would destroy motor transport, with dire results for the nation’s commerce. Several letters to the editor of The Times, as well as an editorial in the same paper, also worried that the railways would find ways to suppress road transport in order to maintain their monopoly. In 1928, when the railways lobbied for the right to use road vehicles in their services, arguing that this would facilitate a more coordinated transport system, Conservative MP Sir Joseph Lamb argued that: “when they use the word ‘co-ordination’ they mean that they are going to get rid of competition.” It was relatively commonplace by now to see motor transport as serious competition for the railways, with 16 percent of all the opinion articles surveyed arguing that point (Table 4.3).

Given the railways’ reputation for monopolistic abuses, it is therefore unsurprising that

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269 Cox 2012.
270 HC Deb 18 March 1919 vol 113 col 1952.
271 HC Deb 10 April 1922 vol 153 col 155.
273 HC Deb 28 February 1928 vol 214 col 306.
many commentators were worried that they would use their commercial and political power to eliminate their rivals.

<table>
<thead>
<tr>
<th></th>
<th>The Guardian (30)</th>
<th>The Times (30)</th>
<th>The Daily Mail (30)</th>
<th>All Newspapers (90)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speed of trains</td>
<td>0.20</td>
<td>0.27</td>
<td>0.13</td>
<td>0.20</td>
</tr>
<tr>
<td>Road competition with railways</td>
<td>0.13</td>
<td>0.13</td>
<td>0.20</td>
<td>0.16</td>
</tr>
<tr>
<td>History of the railways</td>
<td>0.00</td>
<td>0.33</td>
<td>0.13</td>
<td>0.16</td>
</tr>
<tr>
<td>Electrification</td>
<td>0.30</td>
<td>0.03</td>
<td>0.00</td>
<td>0.11</td>
</tr>
<tr>
<td>Labour issues</td>
<td>0.17</td>
<td>0.00</td>
<td>0.17</td>
<td>0.11</td>
</tr>
<tr>
<td>The railways are innovating.</td>
<td>0.17</td>
<td>0.07</td>
<td>0.10</td>
<td>0.11</td>
</tr>
<tr>
<td>The railways are a good way to see the country.</td>
<td>0.07</td>
<td>0.13</td>
<td>0.07</td>
<td>0.09</td>
</tr>
<tr>
<td>Service complaints</td>
<td>0.03</td>
<td>0.10</td>
<td>0.10</td>
<td>0.08</td>
</tr>
<tr>
<td>Progress on the railways.</td>
<td>0.13</td>
<td>0.03</td>
<td>0.03</td>
<td>0.07</td>
</tr>
</tbody>
</table>

Table 4.4: The results of a quantitative content analysis of newspaper opinion articles about railways from the 1930s.

Despite some interest in the railways’ technical progress, particularly in making faster trains, during the 1930s (Table 4.4), many parliamentarians during that decade continued to see the railways’ plight as a form of just comeuppance. Unionist MP Arthur Dixey, for example, argued that “the railway companies have themselves largely to blame” for their commercial plight.274 Labour MP John Palin similarly argued that the railways had invited their situation “largely due to the superiority and the good humoured contempt with which they have treated their customers.”275 Neither Palin, Dixey, nor Lamb was a particularly prominent MP, but the consistency of their message is remarkable given that they all came from different parties. This is evidence that the bipartisan consensus over industrial reform which existed during this period extended to considerations of the railways’ business practices.276 The limited media coverage of the 1938 Square Deal Campaign was largely unsympathetic, with The Daily Mirror’s editor arguing that the railways deserved their predicament due to their poor service record,277 while the paper’s industrial correspondent called the campaign a “menace” that would allow the railways to resume their prior exploitation of traders.278 The core of this story-line was that the railways should regain the public trust before they attempted to appeal to public sympathy. This highlights the damage that poor actor credibility can do to an incumbent regime.

274 HC Deb 28 February 1928 vol 214 col 314.
275 HC Deb 28 February 1928 vol 214 cc301-59.
The evolution of discursive story-lines during socio-technical transitions

4.3.4. The Accommodation of Motor Transport

Positive Story-Lines

During this period, positive story-lines portrayed motor vehicles as a promising means of transport which could end the tyranny of the railways, but which required new infrastructure and legislative changes if it was to reach its potential. The quantitative analysis of opinion journalism reveals that it was still common to portray cars as a form of progress during the 1920s (Table 4.5), and in fact this story-line gained strength, as the anxieties about the railways stamping out road transport discussed in section 4.3.3 demonstrate that road transport was now seen as meaningful competition for the railways.

<table>
<thead>
<tr>
<th></th>
<th>The Guardian (9)</th>
<th>The Times (6)</th>
<th>The Daily Mail (22)</th>
<th>All Newspapers (37)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support for regulation of road transport.</td>
<td>0.33</td>
<td>0.17</td>
<td>0.09</td>
<td>0.16</td>
</tr>
<tr>
<td>Safety concerns.</td>
<td>0.11</td>
<td>0.17</td>
<td>0.14</td>
<td>0.14</td>
</tr>
<tr>
<td>Regulations are nonsensical.</td>
<td>0.11</td>
<td>0.00</td>
<td>0.14</td>
<td>0.11</td>
</tr>
<tr>
<td>Opposition to regulations.</td>
<td>0.00</td>
<td>0.17</td>
<td>0.09</td>
<td>0.08</td>
</tr>
<tr>
<td>Cars and buses are important.</td>
<td>0.22</td>
<td>0.00</td>
<td>0.05</td>
<td>0.08</td>
</tr>
<tr>
<td>Cars threaten the countryside.</td>
<td>0.11</td>
<td>0.33</td>
<td>0.00</td>
<td>0.08</td>
</tr>
<tr>
<td>Cars are a form of progress.</td>
<td>0.00</td>
<td>0.00</td>
<td>0.14</td>
<td>0.08</td>
</tr>
<tr>
<td>Technological solutions to problems.</td>
<td>0.11</td>
<td>0.00</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>Concerns about heavy vehicles.</td>
<td>0.11</td>
<td>0.00</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>Cars threaten or oppress pedestrians.</td>
<td>0.22</td>
<td>0.00</td>
<td>0.00</td>
<td>0.05</td>
</tr>
<tr>
<td>Accidents.</td>
<td>0.11</td>
<td>0.00</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>Complaints about bus service.</td>
<td>0.22</td>
<td>0.00</td>
<td>0.00</td>
<td>0.05</td>
</tr>
</tbody>
</table>

Table 4.5: The results of a quantitative content analysis of newspaper opinion articles about road transport during the 1920s.

As the empirical credibility of road transport grew, advocates of motor transport adopted a more aggressive position on the question of road infrastructure. Prior to the First World War, William Joynson Hicks, an MP who had broad appeal among the Manchester elite and was obsessed with the latest technology,279 had remained modest about the practical possibilities of motor transport, and even opposed the construction of motor roads.280 By the early 1920s, however, he was arguing for dedicated car infrastructure in several newspaper articles and letters to the editor.281 He also began to explicitly compare motor

280 HC Deb 20 May 1909 vol 5 col 653; HC Deb 29 October 1909 vol 12 col 1324.
transport with the railways. In a 1919 piece in *The Times*, for example, Hicks argued that “The railway is tied to lines, the motor van is free of any road; the railway involves many transhipments, the motor van takes produce from door to door; the railway is Socialistic (especially if nationalized), the motor van is individual; and finally the railway is monopolistic, while a motor service is open to all comers.”

Hicks was a radical within the Conservative party, but his appointment as home secretary in 1924—a position which gave him considerable influence over transport policy—demonstrates that his views about transport were becoming respectable. Lord Montagu promoted similar story-lines. In a debate over the 1919 Transport Bill, Montagu offered a romantic portrayal of road transport:

> Roads are one of the oldest forms of civilisation, and poets and philosophers of all ages have descanted on the glories of the road. Roads have had their own special influence on civilisation; roads are to me almost a religion.

In 1921, Montagu contributed at least 18 articles and letters about road transport to *The Times*, including a 12-part series on road reform which argued explicitly that road transport posed a superior alternative to the railways, and which concluded with the prediction that “the coming years are going to be those of a new road transport era.”

Montagu’s visions of future motorways became even more ambitious, and included fanciful schemes to mount the motorways on enormous apartment buildings, or to dig a road tunnel under the English Channel.

Car magazines also began to promote investment in motor roads. In 1919, *Autocar* correspondent Owen John wrote of a dream of a motorized future, in which “…we swept out of London by a wide, broad road with no stoppages or hindrances, and with all traffic apparently moving along at an equal pace… The ease and safety of our progress was remarkable.” These increasingly ambitious visions are evidence of the growing empirical credibility available for positive story-lines about cars. The appearance of so many aggressive arguments in favour of motor roads in the years immediately after the end of the First World War is telling of the new credibility enjoyed by motor transport in the interwar period. John’s vision, however, could only be made possible by altering pre-established rules of the road; a point that John explicitly addressed when he described future road

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283 Cox 2012.
284 HL Deb 30 July 1919 vol 36 col 98.
The evolution of discursive story-lines during socio-technical transitions
designers having realized that “vested rights were not necessarily of all-round advantage”. Similary arguments were common throughout this period in both Autocar and The Motor. In 1928, Autocar argued for political action on the issue: “The work of making these islands fit for motoring can be accomplished only by the organised sections of our several specialised interests becoming mutually active to ascertain the public ends which they have absolutely in common”. The vision of a motorized Britain also began to appeal to actors outside the motoring fraternity, including The London Society, a civic planning advocacy group which in 1919 published “London of the Future”, an essay which imagined an ultra-modern metropolis supported by an elaborate network of arterial and ring roads. In 1923, prominent writer and orator Hillaire Belloc published The Road, which envisioned a motorway from London to Birmingham. While positive story-lines about cars prior to the First World War promoted fanciful visions of the motorized future, car proponents during the 1920s, responding to the growing empirical credibility of motor transport, were actually trying to bring that future about.

Negative Story-Lines

Negative story-lines about motor transport during this period gained empirical credibility and experiential commensurability from problems associated with the growing motor niche, including congestion, accidents, and rural blight (Figure 4.11, Figure 4.12). Critics of motor transport predicted a flood of vehicles that would turn British roads into a battlefield littered with accident victims, or ruin the countryside with long queues of ugly, noisy vehicles along the congested and over-developed trunk roads.

289 Ibid.
293 Merriman 2007, pp. 28-29.
The quantitative content analysis for the 1920s and 1930s illustrates that safety was the most prominent concern about motor transport during this period (Table 4.5, Table 4.6). Articles about road deaths were often highly dramatic. The Manchester Guardian, which raised concerns about safety in over a quarter of its articles about cars, made frequent comparisons between motor accidents and battlefield casualties, describing at one point “the highways of Britain scattered like a battle-front”. Lord Beaverbrook, editor of The Daily Express observed that the automobile, if driven recklessly, “threatens to become an agency of death from which no one can be guaranteed escape,” a stance which fit well with Beaverbrook’s self-image as a tribune of the people, protecting them from the incompetent or malicious authorities. Advertisements for The Daily Mirror’s free accident insurance scheme, which it opportunistically offered to all its subscribers, described the situation as hopeless: “While experts work unceasingly to fight this menace of the streets, hospitals complain of the growing burden to their resources through accident cases. But the toll continues.” These dramatic understandings of the problem led to a conflict between motorists and pedestrian organizations, with each group blaming the death toll on the other group’s recklessness.

Another prominent complaint emphasized the influence of motor traffic on the rural landscape, and the resulting “ribbon development”, in which long rows of houses,

<table>
<thead>
<tr>
<th></th>
<th>The Manchester Guardian</th>
<th>The Times</th>
<th>The Daily Mail</th>
<th>All Newspapers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(11)</td>
<td>(14)</td>
<td>(11)</td>
<td>(36)</td>
</tr>
<tr>
<td>Safety.</td>
<td>0.27</td>
<td>0.07</td>
<td>0.27</td>
<td>0.19</td>
</tr>
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<td>Wartime Restrictions.</td>
<td>0.18</td>
<td>0.14</td>
<td>0.00</td>
<td>0.11</td>
</tr>
<tr>
<td>Technical discussions.</td>
<td>0.09</td>
<td>0.21</td>
<td>0.00</td>
<td>0.11</td>
</tr>
<tr>
<td>Opposition to car taxes.</td>
<td>0.09</td>
<td>0.14</td>
<td>0.00</td>
<td>0.08</td>
</tr>
<tr>
<td>Accidents.</td>
<td>0.09</td>
<td>0.00</td>
<td>0.18</td>
<td>0.08</td>
</tr>
<tr>
<td>Complaints about regulation.</td>
<td>0.00</td>
<td>0.14</td>
<td>0.09</td>
<td>0.08</td>
</tr>
<tr>
<td>Regulations are ridiculous.</td>
<td>0.00</td>
<td>0.07</td>
<td>0.18</td>
<td>0.08</td>
</tr>
<tr>
<td>Cars or roads are destroying countryside.</td>
<td>0.00</td>
<td>0.14</td>
<td>0.00</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Table 4.6: The results of a quantitative content analysis of newspaper opinion articles about road transport during the 1930s.

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296 The Daily Express, 1929, ‘Massacre of the roads’, 17 September, p. 10.
298 The Daily Mirror, 1928, ‘14 killed every day in the year’, 24 August, p. 27.
The evolution of discursive story-lines during socio-technical transitions

billboards, and cheap tourist resorts were built along rural roads (Figure 4.11). This concern accounted for 30 percent of all articles surveyed from The Times during the 1920s (Table 4.5), and was noted by figures such as the Archbishop of Canterbury. In 1935, The Earl of Crawford, a Unionist MP, complained that the increasing motor traffic threatened “the very negation of the English village.” Books such as Clough Williams-Ellis’ England and the Octopus and John Moore’s Britain and the Beast protested these developments, with the latter condemning rural developers with the statement that “the world and your fellows are the worse for your living.”

Figure 4.11: A Daily Express cartoon illustrating concern over the effects of motor traffic on the countryside.


300 O’Connell 1998, p. 150.
301 Moran 2010, p. 140.
302 HL Deb 10 April 1935 vol 96 col 700.
303 Moran 2010, p. 142.
304 Ellis 1975, p. 62.
In response to these concerns, road transport advocates blamed the problems on road infrastructures and traffic laws poorly suited to the needs of motor vehicles, rather than on the vehicles themselves. In particular, they answered concerns about the aesthetics of the countryside and about public safety with calls for new roads which would allow road vehicles to move efficiently and safely while preserving the character of the countryside (Figure 4.13).
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The framing of motor roads as a solution to the problem of rural blight is evident in British newspaper articles about foreign motor roads, such as the Italian autostrada, the German autobahnen, and the American parkways. These roads received glowing reviews in newspapers, which often emphasized their aesthetics.305 A 1937 Guardian editorial on the German Autobahnen argued that “Aesthetic considerations seem as strong an argument for adopting the system in this country as any”.306 In 1943, Frank Jellico put on an exhibition of “New roads for Britain”, which included dioramas of future British motorways, emphasizing their harmony with the countryside.307 The Guardian’s account of Manchester’s planned Princess Parkway to the new suburb of Wythenshawe described roads “slightly diverted in places in order that they may catch woodlands…”308 The Times made similar arguments for the aesthetic appeal of motor roads.309 In 1937, Autocar argued that “the beauty of a modern road is at least a matter of debate, whereas the ugliness of a railway is not”.310

305 Merriman 2007, p. 31; The Daily Mail, 1931, ‘White plains go to black forest’, 20 February, p. 10.
307 Merriman 2007, p. 57
On the issue of safety, road advocates strategically re-interpreted railway actors’ framing of the railways as a safer system to argue that this was due to their access to dedicated infrastructure, and that similar infrastructure should therefore be built for motor vehicles. In 1927, Conservative MP Rear-Admiral Beamish argued that “so few people are run over on the railways … because they are not allowed on the railways. Until we realise that people must be kept off the road … we shall continue to have this terrible toll of life”.311 In 1929, the editor of the Daily Mail argued that “…people have learnt by training and habit to treat [railway crossings] cautiously and to look carefully before they adventure themselves”, arguing that people should therefore be taught to behave similarly when crossing the roads.312 Articles in The Guardian, the Times, and the Daily Mirror framed the issue in a similar way.313 In the motor press, Autocar enthusiastically endorsed making roads more like railways as a way of reducing the accident rate.314 “It is in constructive measures”, argued the magazine, “that the secret [to safety] is to be found”.315 Essayist George Orwell predicted in The Road to Wigan Pier that “The danger of accidents would disappear if we chose to tackle our road-planning problem seriously, as we shall do sooner or later.”316 The adoption of this argument by Orwell, a self-acknowledged socialist, is particularly interesting as it indicates that cars were no longer durably associated with the upper classes.

In 1938, the safety argument was made the focus of an entire book: Alker Tripp’s Road Traffic and its Control, which argued that “the railway tracks were designed solely for mechanical transport…But with the roads there was no such design.”317 Tripp argued that the Ministry of Transport should physically and legally reconstruct roads as spaces for cars, by building new kinds of roads and restricting the rights of other road users. By this time, Parliament had already passed the Trunk Roads Act, with the intention of making 4,500 miles of trunk roads safe for motor traffic. Parliamentary debates over the act illustrate considerable interest in its safety implications of the legislation,318 as does the Ministry of Transport’s choice of slogan for the programme: “The Quickest Way to Safety”.319 The expansion of the motor niche into a road regime thus benefited from story-lines not just

311 HC Deb 10 May 1927 vol 206 col 327.
316 Orwell 1937, p. 12.
317 Tripp 1938, p. v.
319 Our Motoring Correspondent., 1937, Belisha must speed to spend £90,000,000.’ The Daily Mirror, 25 May, p. 8.
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about problems with the railways, but also about problems with motor vehicles themselves, which car advocates argued could be solved through road construction.

4.3.5. Conclusion

During this period, the motor niche came into conflict not just with the railway regime, but also with civil society actors concerned about the social implications of increasing numbers of road vehicles. Prominent story-lines interpreted these struggles in very different ways. Railway actors, having noticed motor transport as a threat, continued to draw on the greater empirical credibility of their system, placing particular emphasis on its safety record, in order to argue for its superiority. Empirical credibility, however, was no longer the sole preserve of railway actors, and motor transport proponents began to explicitly promote road transport as an alternative to the railways. This strengthened anti-railway story-lines, making it very difficult for railway actors to make a good case for relaxed regulations.

The response of motor transport proponents to concerns about accidents and rural blight during this period is interesting and unexpected. These problems lent empirical credibility and experiential commensurability to story-lines critical of motor vehicles, but, surprisingly, they also empowered story-lines arguing for improved road infrastructure. This is a mismatch with the analytical model, which predicts that niche actors will argue for accommodation by highlighting problems with the incumbent regime. While motor transport proponents did increasingly attack the railways during this period, accommodation measures were more commonly justified on the grounds that they would address problems which arose from within the motor regime itself. This mismatch will be considered in more detail in chapter 6.
4.4. Period III: Contestation and Overthrow (1945-1963)

4.4.1. Introduction

The roads became the dominant transport system after the Second World War, as the modal share of private automobiles overtook that of the railways and continued to increase rapidly (Figure 4.14). The development of infrastructure was an important element of this process, as 1955 saw the government propose two major investments in the country's transport infrastructure. The first of these was the railway modernisation programme, intended to introduce electric and diesel traction, as well as other improvements, to the railways, which it had nationalised in 1948. The second was the construction of the country's first road infrastructure restricted only to motor vehicles, starting with the Preston Bypass in 1956, and followed by the M1, the country’s first motorway, in 1959. These two programmes had very different fates. The government announced plans in 1962 to build 1000 more miles of motorways over the next ten years, but by that time the railway modernisation programme was suffering from financial problems. In 1963, British Rail chairman Richard Beeching, who had been appointed by a Conservative government that was sceptical of nationalised industries, announced another plan to make the railways profitable by eliminating loss-making branch lines. These cuts, along with the rapid construction of motorways, cemented the transition to a road-dominated transport system.

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Figure 4.14: British surface passenger transport, 1945-1963. Data from Fouquet, 2012.

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321 Moran 2010, p. 80.
323 Ramsden 1995, p. 4.
Story-lines about these infrastructural changes and about road and rail transport more generally, relied heavily on narrative fidelity, with road and rail actors competing to cast their transport system as an exciting symbol of a modernized Britain. While there were no prominent negative story-lines about road transport, however, negative story-lines about the railway modernisation plan described the railways as a Victorian technology with no place in modern Britain. Ultimately, the view that motorways were more modern than railways had strategic political importance, as the government developed the former while cutting the latter.

4.4.2. The Cultural Landscape

Historian Martin Reuss defines high modernism as “a confident belief in scientific and technological progress, expanding production, rational design of social order, growing satisfaction of human needs, and increasing control of nature”.324 This kind of thinking was an important part of the cultural landscape during this period. It appears prominently as early as December 1942, when social reformer Sir William Beveridge created a plan to use technology and planning to “conquer the five giants—want, ignorance, squalor, idleness, and disease.”325 At the same time, wartime lend-lease arrangements exhausted Britain’s financial resources, helping to reduce the appeal of laissez-faire economic approaches.326 The Labour party election manifesto of 1945, entitled *Let us Face the Future*, embraced both of these trends, advocating a bold and intentional step into a future dominated by science and technology:

> Today we live alongside economic giants - countries where science and technology take leaping strides year by year. Britain must match those strides - and we must take no chances about it. Britain needs an industry organised to enable it to yield the best that human knowledge and skill can provide.327

Though the Conservatives had their own modernising manifesto,328 Labour won the election in a landslide,329 and the post-war labour government set about nationalising key industries, including transport; a move which was justified “in terms of national efficiency as much as by socialist ideology.”330

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325 Pugh 1999, p. 259.
327 Labour Party 1945.
328 Francis 1999; Jones 1999.
330 Pugh 1999, p. 270.
Perhaps most emblematic of the modernist attitude was the nationwide Festival of Britain, taking place across the country during the summer of 1951.\textsuperscript{331} Exhibits at the festival’s venues, which were set up all over the country, covered a range of industries including housing, energy, and consumer durables, and typically placed recent developments in each sector on a time-line reaching from an antiquated past to an exciting high-tech future.\textsuperscript{332} The energy pavilion in Glasgow, for example, traced a line of development from the antiquated coal age to the futuristic nuclear age. Deputy Prime Minister Herbert Morrison described London’s South Bank site as representing “a new Britain springing from the battered fabric of the old”.\textsuperscript{333} Though Conservatives were sceptical of the festival, viewing it as a vanguard of socialism, and many saw 1953’s coronation celebrations as more emblematic of modern Britain,\textsuperscript{334} the Festival of Britain nevertheless established a narrative in which national progress was defined in terms of scientific and technological novelty. This created discursive opportunities for proponents of novel transport systems.

4.4.3. Modernism and the Motorways

Positive Story-Lines

Positive story-lines about the road regime during this period described the development of both car ownership and road construction as exciting harbingers of a coming ‘motor age’. The editor of \textit{Autocar} described an “encouraging state of affairs”, in which “people have become wholly dependent on the car for daily transportation”.\textsuperscript{335} Discussions of car ownership, however, were largely confined to the specialist press, and even there they were marginal compared with more pressing political concerns about road construction and traffic laws. The mainstream press saw the increasing number of motor vehicles as a crisis which demanded action. The dominant theme in newspaper coverage of cars and roads was an argument that the roads needed state investment; a perspective expressed in 41 percent of all articles surveyed (Table 4.7). A plurality of the most popular themes uncovered in the quantitative analysis promoted road improvement in one way or another, with concerns about safety and congestion also commonly raised in support of motorways.

Enthusiastic story-lines about future motorways appeared almost immediately after the end of the Second World War. In 1946, the government first announced plans to construct a national motor road network. Reviews of the plan in the press emphasized its modern

\begin{footnotes}
\item[331] Conekin 1999.
\item[332] Ibid.
\item[333] Conekin 1999, p. 238
\item[334] Conekin 1999, p. 246
\end{footnotes}
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appeal. *Autocar* hailed the plans as “incredibly Utopian to those who fought so long and often unavailingy for such small prizes as by-passes to towns and villages which narrowed our main roads down to mediaeval standards.”336 In a debate over the 1949 Special Roads Act, which would lay the legal groundwork for motorways,337 Transport Minister Alfred Barnes applied the Labour party’s election manifesto to transport, invoking progress narratives very similar to those that would appear at the Festival of Britain two years later:

we saw in the 16th century the parish supersede the lord of the manor, in the 18th century the turnpike trust building up better roads than the parishes, and in the 19th century the railways effectively killing the turnpike trusts. That brings us to the 20th century when we were confronted with the problem of the motor car...338

Before the actual construction of the M1 in 1959, supporters of the motorways condemned the government’s slowness in building the motorways, with 10 percent of the articles surveyed in the quantitative analysis saying that it made Britain a backwards nation stuck with antiquated roads. In 1953, the editor of the *Daily Mail* said that the A1 “conforms to Norman standards—namely that 16 armed knights shall be able to ride along it side by side and that passing ox-herds shall be able to touch goads.”339 Other editorials and letters to the editor, including one written by Labour MP Richard Crossman, complained that Britain’s roads were Victorian or medieval relics.340 Another approach to condemning the government’s perceived inaction was to compare British progress with that of other countries. The *Daily Mail* was the most aggressive proponent of motorways, arguing in 1957 that on the question of Roads, Britain was “the most backwards of all industrial nations.”341 *Daily Express* motoring correspondent Basil Cardew pointed to Dutch motorways order to shame Transport Minister Harold Watkinson, whose performance he called “DREADFUL, DREADFUL, DREADFUL!”342 Such aggressive condemnation of a Conservative transport minister is particularly notable in *The Daily Express*, whose content at that time was closely influenced by its Conservative owner, Lord Beaverbrook.343

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337 Merriman 2006b, p. 82; Merriman 2007, p. 61.
338 HC Deb 11 November 1948 vol 457 col 1738.
343 Williams 2009, p. 231.
editor of The Guardian compared lacklustre British progress with American, Italian, and German motorways.344

<table>
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<tr>
<th></th>
<th>The Guardian (30)</th>
<th>The Times (27)</th>
<th>The Daily Mail (30)</th>
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<td>Alarm over accidents.</td>
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<td>Roads bring economic benefits.</td>
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<td>Panic over increasing numbers of cars.</td>
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<td>Britain is in the motor age.</td>
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<td>0</td>
<td>0.1</td>
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Table 4.7: The results of a quantitative content analysis of newspaper opinion articles about road transport from 1945 to 1963.

A more positive version of the modernist pro-motorway story-line appeared in 1955, when the government announced its first formal plans for a motorway network, displaying their own enthusiasm for the plans by placing a map of the new roads in the House of Commons tea room.345 Newspaper coverage of the motorway plans portrayed them as a technological and social revolution, whose elaborate engineering projects would be objects of national pride; The Daily Mirror, for example, held that a proposed tunnel under the River Forth would “be of outstanding interest in all countries of the world.”346 The Daily Mail proposed a utopian vision of motorway Britain as it would exist in the year 2005: “Along the wide, multi-track motorways leading to the sea the holiday traffic surges in orderly streams. Police helicopters and conventaplane patrols of the newly merged Royal Automobile Association hover overhead”.347 One tenth of the articles surveyed in the Daily Mail argued that Britain had entered a “motor age”, in which investment in motorways was the natural, progressive, and even obligatory thing to do. In 1953, the editor of the Mail endorsed this view, declaring that “we are in the motor age and we must make the best use

345 Merriman 2007, p. 61
346 The Daily Mirror, 1955, ‘Britain’s four year plan to end traffic chaos: A Road through the sea-And a road where drivers MUST hurry’. 3 February, p. 16.
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of it". On the other side of the political spectrum, the editor of The Guardian took a similarly deterministic view, arguing that the 1955 motorway plans “will be no more than a starting point in the real task of matching an eighteenth-century road system to mid-twentieth century traffic". The association of motorways with modernity was reflected in postcards celebrating the motorways (Figure 4.15), as well as sod-breaking ceremonies featuring parades of state-of-the-art construction equipment. While many articles also defended motorway construction for practical reasons related to congestion or road safety (Table 4.7), the narrative fidelity of the modernist story-lines was such that they appeared very frequently in any argument for motorway construction.

Positive coverage of the motorways often did not express very much concern for the cost of the new roads. The Daily Mail's enthusiasm for the tunnel under the River Forth, for example, mentioned the project’s £5,500,000 price tag, but framed it as a point of pride rather than as something deserving scrutiny. Articles which did pay attention to the cost of the motorways typically argued that it would be more than repaid by the economic benefits the new roads would bring. This attitude that road construction justified any expense was made particularly obvious after the 1963 publication of Traffic in Towns, the product of a government committee chaired by civil engineering professor Colin Buchanan that was assigned to investigate the problem of motor traffic in urban environments. The report’s proposals often involved the complete reconstruction of cities to separate pedestrians completely from the road network, thereby permitting faster and safer motor traffic (Figure 4.16). Other than a vague suggestion that they should be funded by car

[Redacted]

Figure 4.15: Two postcards from the early years of British motorways. From Parr 1999, p. 5.

353 Buchanan 1963, p. 169
taxes, Buchanan’s proposals were not meaningfully costed in the report. Instead, the report simply emphasized their necessity. Geoffrey Crowther, former editor of *The Economist* and chair of Buchanan’s steering committee echoed the *Daily Mail*’s “motor age” logic when he justified the report’s proposals on the grounds that “Few of us in Britain realise in what an early stage of the motor age we still are…We are approaching the crucial point where the ownership of private motor vehicles, instead of being the privilege of the minority, becomes the expectation of the majority.”

Buchanan’s proposals were very well-received in the press. A *Daily Mirror* opinion piece said that “If Crowther and Buchanan are right—and they obviously are—cities will have to be degutted, reshaped and rebuilt in a gigantic programme of urban reconstruction.” The editor of *The Guardian* claimed that “This, or something like it, is the answer to the traffic problem”. *The Times* gave the report a full page of coverage, which included a verbatim reproduction of its conclusion, with no critical comments. Buchanan was not fully in favour of re-building England in order to make room for cars, and in fact called for curbs on car use in historic cities, but the broad acceptance of his expensive and disruptive proposals represents a consolidation of the positive story-lines supporting

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355 Buchanan 1963, 10.
358 Buchanan 1963, p. 147.
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motorway construction. Cars and roads were assumed to be an inevitable and desirable part of the future, meaning that motorways and even Buchanan’s proposals for urban re-development were intrinsically beneficial for the country.

Apart from a marginal concern about the effect of roads on the countryside, which could be dismissed by portraying motorways as something that would relieve rural roads of unsightly congestion (Table 4.7), this study did not find any evidence of prominent negative story-lines about the motorways, or about the expanding car regime more generally. It appears that the coming motor age was almost always seen in utopian, rather than dystopian terms, with the greatest worries being over whether Britain could adapt to it quickly enough. The narrative fidelity granted by the high modernism of this period made story-lines supporting motorway construction extremely compelling, and made criticism of the motorways largely untenable. In this context, it is entirely unsurprising that the motorway construction programme was extended for another decade in 1962.

4.4.4. The Railway Modernisation Programme

Positive Story-Lines

Story-lines about the railways during this period addressed the question of whether they had any place in a modernized United Kingdom. Positive story-lines answered this question in the affirmative, arguing that the railway modernisation programme would make British rail more modern, more efficient, and, perhaps most importantly, more solvent. In 1955, when the programme was first announced, the press reacted in much the same ways as they did to the motorway plans, describing it as an object of progress and national pride. The Daily Mirror predicted that the programme would bring about “…a streamlined rail system that will be as different from that of today as the Flying Scotsman is from Puffing Billy”.359 The Guardian’s science correspondent predicted that “the nation should be proud of owning British Railways in 1970”.360 Just two weeks after the re-election of a Conservative government, Conservative MP Robert Crouch extolled the virtues of his party’s transport policy as it effected the railways: “as a result of the modernisation of the railways during the next four or five years, we shall have the most efficient railway system

in the world [and] rail transport will be able to compete efficiently with all the other forms of transport in this country.”

While this story-line was present, however, it did not resonate as strongly as similar story-lines about motorways, and apart from some moderate support for electrification, it does not appear at all in the quantitative analysis of newspaper opinion articles about the railways (Table 4.8). Even the railway press was only cautiously supportive of the programme. The editor of The Railway Gazette, for example, saw the plan as “a realistic plan to set the railways on their feet”, but wondered “how the commission can assess with such confidence that the actual return from this investment should be some £85 million a year”. Railway Magazine was somewhat more optimistic, predicting that “for passengers, remodelling of the operations will provide fast, regular, and frequent services, electric or diesel, in all the great urban areas; inter-city and main-line trains will be accelerated and made more punctual”, but its coverage of the plan was a fairly sober technical and financial analysis, conceding at the outset that “services on other [passenger] routes will be made reasonably economic, or transferred to road”.

When discussing the programme, prominent figures in the government frequently portrayed it as primarily intended to make the railways profitable. Transport Minister Harold Watkinson’s speech on the programme argued that: “We believe that the railway industry has it within its own power to get out of deficit and into profitable operation, and that it can do it by its own efforts.” Chancellor of the Exchequer R.A. Butler agreed that ultimately, “solvency must be assured by modernising plant and equipment.” This emphasis on profitability on the part of the Conservative government reflects their position in a broader political and economic debate over nationalised industries: Having found themselves in possession of a nationalised railway, the least they could do as a party that saw itself as in a struggle against the “nationalisation nightmare” initiated by Labour was to ensure that it was not a drain on the state. This conviction was further encouraged by the party’s economic concerns during 1955. This position on railway modernisation stands in contrast to the motorway construction programme, which was seen as an intrinsic good whose financial costs were of little concern.

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361 HC Deb 09 June 1955 vol 542 cols 131-132.
363 Ibid.
365 HC Deb 03 February 1955 vol 536 col 1282.
366 HC Deb 03 February 1955 vol 536 col 1302.
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Table 4.8: The results of a quantitative content analysis of newspaper opinion articles about railways from 1945 to 1963.

Negative Story-Lines

The dominant negative story-line about the railways portrayed them as an obsolete Victorian technology with no place in modern Britain. This view was particularly common in the Daily Mail, where it accounted for 10 percent of all opinion articles about the railways (Table 4.8). A 1958 column in the Mail argued that “We are spending more than £1,200,000,000 on the 19th-century railways…Is £100,000,000 (the present figure) really enough to set aside for our 20th-century roads?” Another Mail editorial compared the railways with Victorian staple industries such as cotton and coal, whose “palmy days”, the editor argued, were over. As illustrated in the first quote, the Mail’s scepticism about the railways fits well with its editorial conviction that the country was entering a ‘motor age’, to which it must adapt. Other tabloids were more specific, emphasizing complaints about ugly stations, bad food, unreliable schedules, and other problems with service on British Rail. The broadsheets, meanwhile, used more technocratic language to argue that the railways were obsolete. The editor of The Guardian, who by this point was wary of “nationalisation adventures,” wondered whether “even a technically efficient railway will

be able to pay its way in the second half of the twentieth century?" The editor of The Times made a similar argument, noting that “The continued loss of traffic from rail to road has led an increasing number of people to question whether the vast investment programme of the railways is justified.” This may have reflected the Times editorial view, which fit well with the high modernism of the time, that the second half of the twentieth century should be seen as a new beginning after half a century of war and instability.

Similar concerns were raised in parliament, most notably by Fuel and Power Minister Aubrey Jones, who argued that “there is no point in modernising an industry which on other grounds has no great economic hope.” Jones, a Conservative, might have been reiterating his party’s cautiousness about spending due to concerns about the economy, but this view also had its supporters in the Labour Party: Lord Lucas of Chilworth, a Labour Lord, Transport enthusiast and former parliamentary undersecretary to the Minister of Transport wondered whether “the real place of the railways in the transport economy of this country during the next twenty-five years been thought out.” Even British Rail chairman Sir Bryan Robertson made reference to what he saw as a widespread view that the modernisation programme was “some terrible surgical operation being carried out in a desperate endeavour to save a dying patient.” Unlike the motorways, which were undeniably new, the railways’ oldness made them vulnerable to story-lines questioning their relevance. The parliamentarians cited here, as well as in the above discussion on the profitability motive of the modernisation programme, were all prominent figures in deliberations over the country’s industrial, infrastructural, and economic policy. The fact that they saw the railways as at best something that could be improved to be self-supporting, and at worst, an obsolete system that should be allowed to die, did not bode well for the railways’ political competition against the motorways.

In 1957, Brigadier T.I. Lloyd, president of the Railway Conversion League, published The Twilight of the Railways: What Roads They’ll Make. This book, which argues for the conversion of all the country’s railways into motorways, is obviously very biased and was not particularly popular, but it provides a useful illustration of how modernist narratives could be used to advance an anti-railway agenda. The book echoes much of what was being said in the newspapers and in parliament. Its first sentence argues that “Land surface

373 The Times, 1958,’Getting the Right Traffic.’ 1 December, p. 11.
375 HC Deb 03 February 1955 vol 536 col 1355.
376 Boothroyd 2001, p. 64.
377 HL Deb 02 March 1955 vol 191 col 663.
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transportation in Great Britain has lagged behind the times.” 379 Later on, the book condemns the railways as “a load of nineteenth-century solutions to twentieth-century problems” 380, and a relic of “the horse-and-cart era”. 381 Lloyd was a very marginal figure, who would not likely have been taken seriously by very many readers. The arguments he employs here, however, are still illustrative of the kinds of arguments that were most useful to the railways’ opponents.

In 1963, critics of the railways were vindicated by British Rail Chairman Richard Beeching’s report, The Reshaping of British Rail, which recommended cuts to unprofitable branch lines that would dramatically reduce the reach of the country’s railway network. The report firmly endorses the position that British Rail should be profitable, devoting only a very short section to the idea that the railways should be run as a social service, which bluntly concludes that “It is not thought that any of the firm proposals put forward in this report would be altered by the introduction of new factors for the purpose of judging overall social benefit.” 382 This emphasis on profitability is worth noting because of its similarity to the arguments in favour of the modernisation programme, and because of its stark contrast with the enthusiastic story-lines supporting the motorways. So pervasive was the view that the railways must turn a profit that Beeching was even endorsed by the railway press. The editor of the Railway Gazette called the Beeching Report “the most clear, logical, and—despite its size—concise analysis of the position of the railways that has ever been published”. 383 The editor of Railway Magazine similarly surmised that “neither modernisation nor more economical working could make the railways viable in their existing form and total reshaping was the natural corollary.” 384

While some critics in the mainstream press wondered why the railways had to fund themselves while the motorways did not, 385 the editorial lines of all the major newspapers portrayed the Beeching cuts as a bitter pill that had to be swallowed. The Daily Mirror’s front page coverage of the report announced “IT’S tough. It’s brilliant. And it’s RIGHT.” 386 The editor of The Observer dismissed social service arguments for the railways, arguing that “the

379 Lloyd 1957, p. 7.
380 Lloyd 1957, p. 61.
381 Lloyd 1957, p. 44.
382 Beeching 1963, p. 56.
report has shown that what really matters is whether the railways are the most efficient social service.” 387 The editor of *The Times* said that the planned cuts were “of heroic proportions” which would call for political courage in their implementation. 388 Editorials in the tabloids consistently used story-lines about antiquated Victorian railways in support of Beeching. *The Daily Mirror* described the cuts as “a plan for making Britain’s 19th century railway system fit snugly into the second half of the 20th century”; 389 while the *Daily Mail* argued that Britain “cannot tolerate a clanking old transport system that loses £150,000,000 a year”. 390 *The Daily Express*, while it was somewhat more ambivalent, conceded that “nobody in his senses will expect that the railways built to succeed the stage coach can survive unchanged in a Britain where so much of the traffic is carried on the roads”. 391 The reasons behind the Beeching cuts were complex, as was the response to them, but pre-existing negative story-lines portraying the railways as obsolete made Beeching’s proposals considerably more palatable.

Beeching’s few opponents are slightly more visible after the release of the Buchanan Report 8 months later, as many commentators worried about the Beeching cuts’ effect on road congestion. The editor of *The Guardian*, for example, conceded that the railways “have a part to play if the objective is, as Buchanan conceives it, sane and civilised living in cities”. 392 The *Times* received enough letters making similar links between the two reports to publish a section of letters. 393 At this point, however, this was a minority perspective. Though these concerns would lay the ground for a new framing of the railways as an alternative to the roads, the consensus in 1963 was that modernity preferred cars.

4.4.5. Conclusion

The discussion of cars and motorways for this period is notable not just for the strength of the positive story-lines, but for the near-total absence of any negative ones. While the analytical model predicts that the “motor age” utopia so beloved of *The Daily Mail* would also be understood as a dystopia, there is virtually no evidence of anybody taking this view. The balance is very different for story-lines about the railways, with the positive story-line portraying the railway modernisation programme as new, exciting, and intrinsically

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deserving of investment struggling against a much more common one condemning the railways as a Victorian relic that only deserved to survive if it was profitable. While the analytical model is accurate, therefore, in identifying cultural developments such as high modernism as an influence for the overthrow period, its characterization of the balance between positive and negative story-lines might be inaccurate. Whether this is a quirk of the case, where pro-car narratives were unusually strong, or a reflection of a more general pattern in transitions, will have to be determined through other case studies, including the one presented in Chapter 5 of this thesis.

This period also illustrates the impact that story-lines can have on other aspects of a transition, as negative story-lines about the railways played an important role in making the Beeching cuts politically palatable, and making the motorways a political priority. The disparate support enjoyed by railways and roads was the result of a huge variety of technical, economic, and political developments which extend well beyond the subject matter of this thesis, but this section suggests that the dominant story-lines about road and rail transport, which were themselves influenced by the cultural landscape, may have played a role in making a shift to a road-dominated transport system more desirable.

4.5.1. **Introduction**

The Beeching cuts meant that by the early 1970s, large areas of the country had become inaccessible except by road. The motorway construction programme, meanwhile, continued unabated well into the 1980s: The 1962 target for 1,000 miles of motorway in 10 years was met in 1972, and in 1989 the Thatcher Government published *Roads for Prosperity*, a white paper which proposed even further motorway construction. These developments contributed to a rapid increase in the total distance travelled by road between the 1960s and the 1990s, while the cut-back railway network stagnated (Figure 4.17).

![Figure 4.17: British surface passenger transport, 1963-1990. Data from Fouquet, 2012.](image)

Increasing numbers of cars, however, led to the continuation of problems such as accidents and congestion, and the occurrence of new ones such as air pollution, urban and rural disruption due to motorway construction, fuel crises, and eventually climate change. As the previous decades’ optimism for motorways waned, these problems developed into bitter struggles, particularly those over motorway construction, which occurred from the 1970s

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394 Moran 2010, p. 80.
395 Dudley and Chatterjee 2011, p. 693.
396 Moran 2010, pp. 80, 83, 188.
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onwards. The railways, meanwhile, failed to turn a profit despite Beeching’s interventions, and in 1968 the Labour government abandoned the previous government’s commitment to a profitable railway system by providing grants for the maintenance of unprofitable but socially essential railway lines. Despite innovations such as the introduction of high-speed intercity trains in 1976, the railways continued to need these subsidies to survive. In 1983 the Serpell Report, commissioned as a second assessment of the railways' finances, proposed a second round of cuts to the railways, the most extreme version of which would have left Scotland without any railway service north of the Edinburgh-Glasgow line. These cuts were never implemented, but they nevertheless represent a low point in support and confidence for the railways.

Persistent problems with the road regime gave rise to a new negative story-line portraying cars and roads as a dehumanising system whose unchecked growth threatened the environmental and social integrity of the country. Positive story-lines about cars emphasized incremental innovations within the road transport regime as solutions to some of these problems, but also relied on the fact that cars were taken for-granted as the country’s dominant transport system. Meanwhile, the predominant negative story-line, portraying the railways as an obsolete system that continuously haemorrhaged money, began to be challenged by a positive story-line in which the railways were a promising alternative to the problem-ridden road system.

4.5.2. The Cultural Landscape

The technocratic optimism and enthusiasm for government intervention which predominated during the post-war period began to give way to disillusionment during the economic troubles of the early 1970s. At the same time, a growing environmental movement was evidenced by the founding of new organizations, such as Greenpeace and Friends of the Earth, while older conservationist organizations experienced a surge in membership. Confidence in the future of British economic and technological systems was also shaken by a fuel crisis in 1973, when oil-producing nations restricted their fuel exports to the United Kingdom.

397 Merriman 2007, p. 207.
399 Harris and Godard 1997, p. 32.
400 Bagwell 1988, p. 397.
403 Pugh 1999, pp. 324, 332
None of these developments boded well for the motorways; a centrally-planned project which required large areas of land to be dug up and paved over, and which had relied on technological optimism for its early support. The new movements discussed above did not uniformly support the railways, which were also a heavily bureaucratic, centrally-run system. The railways, however, were not the centre of attention in the same way that the motorways were, and so they and other alternative transport infrastructures were more able to be interpreted in light of their positive comparisons with the incumbent regime, rather than their historic flaws.

4.5.3. Maintaining the Motor Regime

Positive Story-Lines

Positive story-lines about cars during this period were mostly limited to commercial discourses in advertisements and car magazines, rather than political or cultural discourses. This is because by this point, cars were simply taken for-granted as the dominant means of travel, and thus did not attract very much attention or excitement except from in media appealing to car enthusiasts or those about to buy cars. A positive story-line portraying cars as embodiments of freedom, adventure, and power persisted in media aimed at these groups, such as in car magazines (Figure 4.18), while idyllic depictions of motor tours remained common in the motor press.\footnote{Autocar, 1968, “Holiday touring guide”. 129 (3781), pp. 1-8.} Support for the car regime on the grounds that cars were exciting adventure machines does not show up in the quantitative analysis, which instead highlights the problems with the car regime (Table 4.9). Because cars had become a commonplace and mundane mode of transport, the idea that they were exciting had no more experiential commensurability for anybody outside of a small community of dedicated car enthusiasts.
The evolution of discursive story-lines during socio-technical transitions

<table>
<thead>
<tr>
<th>The roads are dangerous.</th>
<th>The Guardian (28)</th>
<th>The Times (30)</th>
<th>The Daily Mail (30)</th>
<th>All Newspapers (88)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Pollution.</td>
<td>0.18</td>
<td>0.23</td>
<td>0.03</td>
<td>0.15</td>
</tr>
<tr>
<td>Motorways threaten cities.</td>
<td>0.11</td>
<td>0.20</td>
<td>0.03</td>
<td>0.11</td>
</tr>
<tr>
<td>Motorways threaten the countryside.</td>
<td>0.11</td>
<td>0.20</td>
<td>0.00</td>
<td>0.10</td>
</tr>
<tr>
<td>Noise from cars.</td>
<td>0.11</td>
<td>0.20</td>
<td>0.00</td>
<td>0.10</td>
</tr>
<tr>
<td>Safety concerns.</td>
<td>0.04</td>
<td>0.13</td>
<td>0.13</td>
<td>0.10</td>
</tr>
<tr>
<td>Concerns about reckless driving.</td>
<td>0.11</td>
<td>0.07</td>
<td>0.10</td>
<td>0.09</td>
</tr>
<tr>
<td>Public transport provides a useful alternative to cars.</td>
<td>0.14</td>
<td>0.03</td>
<td>0.07</td>
<td>0.08</td>
</tr>
<tr>
<td>The motorways are mismanaged.</td>
<td>0.11</td>
<td>0.10</td>
<td>0.03</td>
<td>0.08</td>
</tr>
<tr>
<td>Technological solutions to problems on the roads.</td>
<td>0.04</td>
<td>0.13</td>
<td>0.03</td>
<td>0.07</td>
</tr>
<tr>
<td>Discussions of the British car industry.</td>
<td>0.11</td>
<td>0.00</td>
<td>0.10</td>
<td>0.07</td>
</tr>
<tr>
<td>Suggestions for improvements to the motorways.</td>
<td>0.00</td>
<td>0.10</td>
<td>0.07</td>
<td>0.06</td>
</tr>
<tr>
<td>The railways provide a useful alternative to the roads.</td>
<td>0.00</td>
<td>0.07</td>
<td>0.07</td>
<td>0.05</td>
</tr>
</tbody>
</table>

Table 4.9: The results of a quantitative content analysis of newspaper opinion articles about road transport during the 1970s.

Figure 4.18: A Vauxhall magazine advertisement and a title page of Car magazine, both emphasizing power and adventure.

In response to problems with cars, such as pollution or fuel scarcity, the most common response from actors within the car regime was to incremental technological improvements, such as better engine design and maintenance.\footnote{The Guardian, 1967, ‘Traffic and Air Pollution’, 23 August p. 6.; The Daily Mail, 1963, ‘Clear the Air.’ 3 November, p. 1; Cardew, B., 1966, ‘Out Soon: A Device to Cut Car Fumes’, The Daily Express, 10 February, p. 13.} The motoring press began to promote public transit and railways in order to address issues such as fuel scarcity, pollution and congestion.\footnote{Autocar, 1973, ‘On the buses’, 138 (4007), p. 2; The Motor, 1968, ‘The Voice of Reason.’ 3437(1); Eves, E., 1973, ‘Emissions in the UK’, Autocar. 138 (4013), pp. 18-20.; Autocar, 1973, ‘Inter-city travel: London to Birmingham by car and train’, 138 (4007), pp. 4-7.; Baxter, R., 1973, ‘Tomorrow’s motoring world’. Autocar 138 (4012), pp. 4-7.} Car might have been the most radical; its August 1973 issue included a title page featuring environmentalist imagery, and included several articles highlighting progress on alternative transport systems.\footnote{Winding-Sorensen, J., 1973, ‘Home, James, and don’t spare the gremlins’, Car. August, 1973. pp. 26-27.} (Figure 4.20). Discussions of electric cars in the mainstream press became more popular, peaking in 1973 (Figure 4.19). Importantly, however, none of these visions illustrates a total shift away from the private automobile. Autocar’s imagery shows an efficient, Buchanan-esque urban street operating beneath the public transit system, while the mass transit systems promoted by Car had largely been designed by car companies. The promotion of these alternatives by the car press during the 1970s is therefore similar to the promotion of road transport by the railway press at the turn of the twentieth century: It represents the actions of a secure regime looking to the marginal use of some competing technologies to fill holes in its own system.

![Figure 4.19: Brief attention to electric cars in newspapers during the 1970s. Data from Gale group, 2014a; Gale Group 2014b; Proquest; ukpressonline.](image-url)
The evolution of discursive story-lines during socio-technical transitions

As the motorway system became commonplace and mundane during this period, positive story-lines about it appeared less often, and were sometimes replaced with disillusionment. In 1969, the *Architects’ Journal* wrote that “the era of euphoria, when we drove up and down the M1 merely to savour the delights of driving up and down the M1, is past.”\(^{408}\) Belated attempts to capitalize on enthusiasm for the motorways, such as Leeds’ decision to name itself “motorway city of the 70s,” were met with derision.\(^{409}\) *The Daily Mail* abandoned its utopian story-lines about motorways, and in one article its editor used Birmingham’s ‘spaghetti junction’ interchange as a metaphor with which to attack trade unionist Vic Feather, whose mind the *Mail* claimed was “a sort of spaghetti junction. Ideas are fed into it, they zoom around in circles, and then are never seen again.”\(^{410}\) Comparisons between any person and the M1 in the early 1960s would have had a much more positive connotation. The opening ceremony for the final section of the M25 motorway around London had to be carefully planned to avoid protesters, who by then were appearing frequently to oppose motorways.\(^{411}\) Prime Minister Margaret Thatcher’s speech at the ceremony went to great lengths to make the road seem acceptable, conceding that “Of

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\(^{408}\) Merriman 2007, p. 200.
\(^{409}\) Moran 2010, pp. 210-213.
\(^{411}\) Moran 2010, p. 391.
course, the road runs through some of the most attractive countryside, but great efforts have been made to blend it into the landscape, including the planting of some two million trees”. Mainstream media coverage of the M25 either criticized it, dismissed it, or ignored it entirely. The editor of the Daily Mirror referred to “Gushing Maggie’s Motorway Madness”, arguing that “Britain’s motorways are to the Tories what the tower blocks are to the Labour Party. Something best forgotten.” The decline of positive story-lines about the motor regime is reminiscent of story-lines about the railway regime during the first period: Because the dominant transport system could exist without public enthusiasm, few actors went to great lengths to cultivate it.

**Negative Story-Lines**

Negative story-lines, about cars and roads during this period gained empirical credibility and experiential commensurability from problems such as accidents, air pollution, noise, and the displacement of people by motorway construction projects; problems which were mentioned frequently in opinion journalism about the motorways (Table 4.9, Table 4.10). These problems were not all new. Controversies over the routing of motorways, for example, occurred even during the peak of motorway enthusiasm during the 1950s. However, the number of and perceived severity of problems which anti-road story-lines could draw on began to increase from the 1960s onward. Air pollution, for example, became an important issue during the 1960s, as many parliamentarians and correspondents to major newspapers expressed increasing concern about urban air quality.

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During the 1950s, these problems were mainly dismissed by mainstream commentators. On the rare occasions when newspaper editors did consider them, they always included caveats, such as the *Manchester Guardian*’s comment that “The cars must come; it is right that they should come”, which was placed in the middle of an editorial on motorway routing controversies. A *Times*’ editorial about pollution noted that “Nothing can change the fact that a railway network flung out of the nineteenth century is unlikely to meet the needs of the twentieth and twenty-first”. This indicates that the car regime had a monopoly on empirical credibility: Regardless of its problems, it was the only viable transport system.

The 1973 fuel crisis added fuel security to the list of concerns about the car regime, and brought additional empirical credibility to the idea that it had fundamental problems. During the 1970s, 8 percent of opinion journalism about cars promoted visions of alternative transport systems involving railways, electric cars, and even moving sidewalks (Table 4.8). Some newspaper editors began to question the long-term sustainability of the car regime and proposed the use of alternatives such as railways and public transport. A letter to the editor of *The Guardian* expressed gratitude to the OPEC nations “for what they are doing to reduce pollution in Britain”. As concerns about the road regime became more common in the mainstream press (Table 4.10), a story-line emerged condemning cars as a dangerous and alienating system which threatened to pave over the entire country. In response to a planned motorway through Edinburgh, for example, one correspondent in

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*The Observer* asked “Are we entitled to tear down our cities and deprive our children of a unique architectural heritage because of a transient obsession with one form of transport?” while a correspondent in *The Times* argued that “Once [motorways] are built, the damage is done forever.”

This story-line about a destructive, dangerous and alienating car system also appears in literature from the 1970s. J.G. Ballard’s 1973 novel, *Crash*, considers the phenomenon of car crashes, while *Concrete Island*, published by Ballard the following year, tells the story of a driver who becomes marooned on a small strip of verge between motorways. The novel takes care to point out the churchyard, cinema, and air raid shelter that were buried underneath the motorway on which its protagonist was stranded, calling attention to the destruction that is required to build a motorway. Peter Nicols’ 1974 play, *The Freeway*, plays on similar themes of alienation in a car-dependent society; imagining a three-day traffic jam in which drivers are left to fend for themselves. Douglas Adams’ science fiction comedy novel, *The Hitchhiker’s Guide to the Galaxy*, a 1981 adaptation of a 1978 BBC radio play, begins with the Earth being destroyed to make way for a hyperspace bypass. Similar themes emerged from non-fiction and academic literature. In 1975, academic Fred Inglis described an ugly scene in Bristol, where “a six-lane motorway in full play unrolls a thick carpet of noise and lead-poisonous fumes,” and condemned the motorway as “a brutal and irrational effort to solve a trivial difficulty by destroying everything in the way”. Architectural critic Tony Aldous *Goodbye Britain?* argued that

Five yards of your garden taken for a modest road widening in the 1950s was one thing; the transformation of your whole surroundings by a 100ft wide swathe of concrete and asphalt and relentless alien movement is quite another. Instead of the quiet though perhaps tatty little footpath or lane between gardens which granny used to follow to the shops, she finds the civil engineers expect her to use a subway that is little better than a dark and smelly drain.

Other books, such as R.E. Paul’s *Whose City* and Colin Amery’s *The Rape of Britain* promoted a similar story-line. Renowned poet Sir John Betjemen complained that “After the Second World War, the word ‘develop’ was beginning to mean ‘destroy’.”

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423 Merriman 2007, p.209
424 Merriman 2007, p. 208
425 Adams 1981.
426 Merriman 2007, p. 205
427 Aldous 1975, p. 10
428 Ibid.
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Perhaps the most dramatic effect of this story-line during the 1970s was the activist campaign launched by Sheffield Polytechnic lecturer John Tyme, who made a name for himself by disrupting public inquiries in advance of motorway construction projects.430 A Daily Mail article written by Tyme demonstrates his adherence to a story-line about polluting and alienating motorways carving up the country (Figure 4.21).431 In an opinion piece in The Daily Mail, Tyme compared motorways with the Black Death, citing accidents, and the creation of urban ghettos as reasons to oppose them.432 Tyme received minor support in the mainstream press and in parliament, particularly for his complaints about the undemocratic nature of the inquiry process.433

Tyme and other critics of the road regime faded from view during the 1980s, but the British Social Attitudes Survey records considerable public concern about the problems with the expanding road transport system,434 and the quantitative content analysis shows persistent concerns about the road regime, as well as support for public transport, including the railways, as an alternative to it (Table 4.9). Many newspaper articles argued that new roads would simply be filled up with new traffic, nullifying any benefit they may have had in reducing congestion. These story-lines reached the public stage once again in 1989 with the release of the Thatcher government’s Roads for Prosperity white paper.435 Opposition leaders condemned the plan, citing issues such as pollution, congestion, and climate change, and repeated the same anti-car story-line that had been used by John Tyme ten years earlier.436 Shadow Secretary of State for Transport John Prescott argued that “10-lane super-highways speeding traffic into the cities are useless if chronic congestion means that it cannot move in the cities when it arrives there.” 437 Labour MP Harry Cohen predicted that the plan would bring about “a country that is not green but motorway grey.” 438 Roads for Prosperity fit in well with the Conservatives’ narrative, in which they had presided over a period of national prosperity, with the associated rise in car ownership,439

429 Aldous 1975, p. 6
430 Merriman 2007, p. 70; Doherty, Paterson and Seel 2000, p. 6
432 Tyme, J., 1977, ‘This is the motorway mania’, The Daily Mail. 10 June., p. 6.
435 Dudley and Chatterjee 2011, p. 693.
436 HC Deb 29 June 1989 vol 155 cc522-3W522W; HC Deb 10 July 1989 vol 156 cc669-70.
438 HC Deb 18 May 1989 vol 153 col 491.
439 Norton 1996, p. 62
and so in criticising it, the Labour opposition had to find a different way to frame it. This was provided by ongoing complaints about the motorways and the road regime more generally, which by this point had created a story-line compelling enough to be aired in parliament as a direct challenge to the motorway construction.

Defensive Story-Lines

The response to this anti-car story-line from supporters of the road regime emphasized the necessity of driving as an essential means of transport. A slate of letters published in *The Guardian* in December 1973 pointed out that the car had become “an integral factor in the rural economy”, and that in many areas “the car is the only means of buying foodstuffs and reaching employment”.440 The reaction to John Tyme in the mainstream press was largely dismissive, on the grounds that there was no viable alternative to road transport.441 *How do you want to live?,* a government report which noted many persistent complaints against the road regime, nevertheless noted that “many people still find [the car] the most comfortable,  

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440 Grant, J. et al., 1973, ‘Where the car is more than a luxury’, *The Guardian.* 6 December, p. 16.  
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convenient and desirable means of getting about”. As with the railways at the turn of the twentieth century, actors defending the motor regime relied mainly on empirical credibility, emphasizing its status as the only credible transport regime of its time.

4.5.4. The Railways Limp Along

Positive Story-Lines

Positive story-lines about the railways remained marginal throughout much of this period, Railway posters from after 1963 emphasized operational details of the railway system, such as timetables and concessionary fares (Figure 4.22). British Rail faced an uphill battle to promote even its most innovative services, however. Advertisements for Intercity 125, a new class of high-speed trains launched in 1976, optimistically proclaimed that “This is the age of the train” (Figure 4.22), but mainstream newspapers don’t appear to have agreed. Though there was newspaper coverage of the new “Super Trains”, no editorial or opinion column took any interest in them, much less used them to argue that the country was in the midst of a railway renaissance. Railway magazines, meanwhile, became less vocal in support of British Rail, as they cultivated a new audience of enthusiasts, as in the case of Railway Magazine, or international business professionals, as in the case of the Railway Gazette. The most common story-line found by the quantitative analysis of mainstream newspapers during the 1970s and 1980s portrayed British Rail as incompetent (Table 4.1, Table 4.12).

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442 Department for Environment 1972, p. 102.
443 Harris and Godward 1997, p. 32.
That same analysis, however, also reveals that critiques of the road regime were enabling a new positive story-line about the railways, portraying them as a promising alternative to the problem-ridden road regime. This made up a quarter of opinion articles about the railways from the 1970s that were surveyed for this study, and remained visible in the quantitative content analysis of the 1980s (Table 4.11, Table 4.12). The quantitative analysis also found many articles supporting subsidies for the railways, or arguing that road transport received an unfair subsidy in the form of free roads.

Figure 4.22: British Rail advertisements from after the Beeching cuts.


The evolution of discursive story-lines during socio-technical transitions

<table>
<thead>
<tr>
<th></th>
<th>The Guardian (28)</th>
<th>The Times (27)</th>
<th>The Daily Mail (21)</th>
<th>All Newspapers (76)</th>
</tr>
</thead>
<tbody>
<tr>
<td>British Rail is incompetent.</td>
<td>0.14</td>
<td>0.00</td>
<td>0.24</td>
<td>0.12</td>
</tr>
<tr>
<td>Support for railway subsidies.</td>
<td>0.18</td>
<td>0.11</td>
<td>0.00</td>
<td>0.11</td>
</tr>
<tr>
<td>Service complaints.</td>
<td>0.00</td>
<td>0.11</td>
<td>0.24</td>
<td>0.11</td>
</tr>
<tr>
<td>Railways provide a useful alternative to roads.</td>
<td>0.25</td>
<td>0.00</td>
<td>0.00</td>
<td>0.09</td>
</tr>
<tr>
<td>Labour issues.</td>
<td>0.07</td>
<td>0.11</td>
<td>0.10</td>
<td>0.09</td>
</tr>
<tr>
<td>Roads threaten the integrity of the country.</td>
<td>0.18</td>
<td>0.00</td>
<td>0.00</td>
<td>0.07</td>
</tr>
<tr>
<td>High-speed rail visions.</td>
<td>0.04</td>
<td>0.11</td>
<td>0.05</td>
<td>0.07</td>
</tr>
<tr>
<td>Praise of railway service.</td>
<td>0.00</td>
<td>0.15</td>
<td>0.05</td>
<td>0.07</td>
</tr>
<tr>
<td>Air pollution from cars.</td>
<td>0.14</td>
<td>0.00</td>
<td>0.00</td>
<td>0.05</td>
</tr>
<tr>
<td>Railways are more fuel efficient than roads.</td>
<td>0.11</td>
<td>0.04</td>
<td>0.00</td>
<td>0.05</td>
</tr>
<tr>
<td>History of the railways.</td>
<td>0.00</td>
<td>0.15</td>
<td>0.00</td>
<td>0.05</td>
</tr>
<tr>
<td>Beeching was wrong.</td>
<td>0.11</td>
<td>0.00</td>
<td>0.00</td>
<td>0.04</td>
</tr>
<tr>
<td>Railways provide economic and social benefits.</td>
<td>0.11</td>
<td>0.00</td>
<td>0.00</td>
<td>0.04</td>
</tr>
<tr>
<td>Road transport is unfairly subsidised.</td>
<td>0.11</td>
<td>0.00</td>
<td>0.00</td>
<td>0.04</td>
</tr>
<tr>
<td>Environmentalism.</td>
<td>0.11</td>
<td>0.00</td>
<td>0.00</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Table 4.11: The results of a quantitative content analysis of newspaper opinion articles about railways during the 1970s.

<table>
<thead>
<tr>
<th></th>
<th>The Guardian (17)</th>
<th>The Times (30)</th>
<th>The Daily Mail (30)</th>
<th>All Newspapers (77)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Ministry of Transport or British Rail is incompetent.</td>
<td>0.29</td>
<td>0.10</td>
<td>0.27</td>
<td>0.21</td>
</tr>
<tr>
<td>Service complaints.</td>
<td>0.00</td>
<td>0.10</td>
<td>0.43</td>
<td>0.21</td>
</tr>
<tr>
<td>Labour issues.</td>
<td>0.41</td>
<td>0.10</td>
<td>0.13</td>
<td>0.18</td>
</tr>
<tr>
<td>New railway investment is needed.</td>
<td>0.12</td>
<td>0.10</td>
<td>0.10</td>
<td>0.10</td>
</tr>
<tr>
<td>Accounts of horrible railway journeys.</td>
<td>0.00</td>
<td>0.07</td>
<td>0.20</td>
<td>0.10</td>
</tr>
<tr>
<td>History of the railways.</td>
<td>0.00</td>
<td>0.20</td>
<td>0.07</td>
<td>0.10</td>
</tr>
<tr>
<td>Railways provide a useful alternative to the roads.</td>
<td>0.00</td>
<td>0.07</td>
<td>0.10</td>
<td>0.06</td>
</tr>
<tr>
<td>Keep the Settle-Carlisle line.</td>
<td>0.12</td>
<td>0.00</td>
<td>0.07</td>
<td>0.05</td>
</tr>
<tr>
<td>The railways are improving.</td>
<td>0.00</td>
<td>0.13</td>
<td>0.00</td>
<td>0.05</td>
</tr>
<tr>
<td>Complaints about fares.</td>
<td>0.12</td>
<td>0.00</td>
<td>0.03</td>
<td>0.04</td>
</tr>
<tr>
<td>Safety Concerns</td>
<td>0.12</td>
<td>0.00</td>
<td>0.03</td>
<td>0.04</td>
</tr>
<tr>
<td>Opposition to the proposed Serpell cuts.</td>
<td>0.12</td>
<td>0.00</td>
<td>0.00</td>
<td>0.03</td>
</tr>
<tr>
<td>Trains bring social or economic benefits.</td>
<td>0.12</td>
<td>0.00</td>
<td>0.00</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Table 4.12: The results of a quantitative content analysis of newspaper opinion articles about railways during the 1980s.
An interesting indication of the popularity of this new story-line is the increasing condemnation that newspaper columnists aimed at Richard Beeching after he left British Rail in 1965. A 1973 letter to the editor of *The Times* blamed Beeching for making residents of rural areas dependent on private cars. This letter was still largely supportive of Beeching, as was another one published in *The Daily Mail* in 1976, but Beeching’s legacy began to suffer thereafter. Several articles from 1979 onwards used the Beeching cuts as a cautionary tale about short-sighted government policy, and four percent of articles from the 1970s surveyed in the quantitative analysis argued that Beeching had been wrong (Table 4.11). By 1987, Beeching was the subject of overt condemnation and blamed for the country’s high rate of road deaths. *Times* columnist Charles Marshall remarked in 1987 that Beeching had secured “a permanent place in the halls of infamy”. Beeching’s logic, which had seemed inescapable in 1963, became less convincing as problems with the car regime undermined the empirical credibility of Beeching’s view that road transport could amicably replace rural railways.

The perceived value of the railways as an alternative to the roads can also be seen in discussions about plans for the Channel Tunnel, which were published in 1973. Many MPs shared Transport Minister John Peyton’s view that the tunnel should be embraced for its ability to “relieve the roads of several million tons of goods”. Parliamentarians frequently referenced the fuel crisis and air pollution as reasons to support the tunnel. Lord Champion, a Labour member of the House of Lords, invoked the spectre of the roads “choking…our cities and towns with stinking, polluting vehicles; [and] destroying the quality of life in our towns by tearing out whole neighbourhoods and communities and running through them miles of concrete slabs with fascinating but hideous spaghetti junctions.” His speech received support from several other Lords. A *Daily Express* opinion piece similarly argued that the tunnel would help avert “a concrete and tarmac

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452 HL Deb 14 June 1972 vol 331 col 996.
453 HL Deb 14 June 1972 vol 331 cols 996, 1016, 1027.
nightmare as juggernaut lorries pound noisily across the length and breadth of what was once a green and pleasant land.”⁴⁵⁴ A letter to the editor of The Times made a similar argument,⁴⁵⁵ proposing a policy that would have required all goods coming to London from outside the South-East to arrive by rail.

Environmental organisations also began to support the railways as an alternative to the roads during the 1970s. In 1972, the leaders of the Friends of the Earth, the Ramblers' Association, and a range of other environmental groups wrote a joint letter to the editor of The Times arguing that the railways are “capable of being utilized to keep a higher percentage of heavy goods traffic off the roads than at present.”⁴⁵⁶ John Roberts, a professor who was an expert on the effect of new motorways on local communities,⁴⁵⁷ argued in The Manchester Guardian that “The car and lorry are inefficient users (rather like that other device we're trying to live without, the open fire), compared with bus and rail.”⁴⁵⁸

In 1975, though he continued to advocate road construction, the Transport Minister conceded that it was worthwhile to “shift freight and passenger traffic from road to rail.”⁴⁵⁹ This attitude is further evidenced by the reaction to the cuts proposed in the Serpell Report. David Howell, the Secretary of State for Transport for the government that had commissioned the Serpell Report, was apparently well-aware of the growing support for the railways, as he distanced himself and his government from Serpell’s proposals, saying that “it would be foolish to come to settled conclusions on any one of these questions in isolation.”⁴⁶⁰ There was an election coming up that summer, and the Labour party had adopted a “rhetoric of resistance” against Thatcher’s policies that year, so the cuts proposed in the report were aggressively criticized by Labour MPs. Robert Adley argued that: “The liabilities in the roads sector include accidents, pollution, congestion and land use… I do not see anywhere in Serpell an evaluation of human life when discussing costs.”⁴⁶¹ Adley, a self-described “railway fanatic”,⁴⁶² had a vested interest in taking this

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⁴⁶⁰ HC Deb 20 January 1983 vol 35 col 486.
⁴⁶¹ HC Deb 03 February 1983 vol 36 col 450.
Adley's language illustrates the utility of anti-car story-lines for the railways' most ardent supporters. In the mainstream press, *The Daily Mirror* argued that Prime Minister Thatcher hated the railways “not because they are safe, nor even because they use much less oil than road transport, but because they are publicly owned”. A letter to the editor of the *Daily Express*, which the editors titled “On Track to a Doomed Environment”, predicted that Serpell’s proposals would “entail ever greater lack of safety, and the gobbling up of spaces for parking and even more roads”. This, along with the opposition to *Roads for Prosperity* discussed in section 4.5.3, illustrates that positive story-lines portraying the railways and negative story-lines condemning motorways had reached the political mainstream by this point.

**Negative Story-Lines**

Negative story-lines about the railways during this period were relatively rare, likely due to the fact that the railways were simply not attracting very much attention. Supporters of the motor regime were comfortable in their dominant position, and, as discussed above, even willing to consider the railways as a way to solve some of its internal problems. Nevertheless, there is still evidence of a negative story-line portraying British Rail as a chaotic, poorly-managed system with no serious claim to being an important part of the British transport infrastructure. This was given experiential commensurability by complaints about hooliganism, unfair ticketing policies, late trains, and chaotic stations, which remained common in the newspapers from this period (Table 4.11, 4.12). Because commentators could no longer blame these problems on monopolistic and abusive private railway companies, the prevailing explanation was that the management of British Rail was simply incompetent. In 1967, the editor of the *Daily Mail* said that “The conduct of British Rail sometimes passes all comprehension”, and that they simply “cannot run a competent train service”. A 1982 letter to the Mail wondered “does nobody staffing the railways care

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anymore? A 1987 Guardian editorial derisively accused British Rail of “knowing better than the customer what he or she wants”.

Another common negative story-line about the railways simply dismissed them out of hand, portraying them as a system that had long ago become impractical. This was most common in car magazines. While, as previously mentioned, car magazines often looked to the railways as a way of solving problems such as fuel shortages or pollution, they often made a point of asserting the natural superiority of cars as a transport system for the twentieth century. Even in 1973, at the height of the fuel crisis, when Autocar was arguing that more traffic should be put on rails, it concluded that “it is quicker by car, that it is cheaper by car, and that—for many of us who still find pleasure in motoring—it is also much more enjoyable by car”. In another article, Autocar argued that despite the desirability of putting more freight on the rails, “the rail has priced itself out of the transport world to a sad extent, and no railway can deliver goods to everyone’s door. The lorry will remain.” Both of these quotations are concluding sentences of their respective articles, indicating what those most connected with the motor regime thought was the final word on the railways. This reflects a deficit of empirical credibility for the railways in a Britain where the roads had become the only proven comprehensive transport system. When combined with the strong experiential commensurability enjoyed by story-lines portraying British Rail as incompetent, the result was a very strong story-line saying that the railways were not to be taken seriously.

4.5.5. Conclusion

This period has some interesting similarities with the first and second periods. In each case, the dominant transport regime was commonly understood as the default, albeit somewhat problematic, means of transport, while a more marginal technology positioned itself as a promising alternative to the incumbent system. By the 1960s the motor regime was playing the role of an incumbent, while a marginalized railway regime challenged it from below. Positive story-lines about the railways benefited from strong narrative fidelity, as they could flexibly tailor their story-lines to the cultural landscape, the most notable elements of which were environmentalist narratives and concerns over fuel security.

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The most reliable positive story-lines about the motor regime during this period depended on the empirical credibility it enjoyed as the most viable transport system. Proactive story-lines which portrayed cars as exciting adventure machines were mostly aimed at audiences pre-selected for their interest in cars: car enthusiasts in the case of car magazines, and prospective car purchasers in the case of advertisements. While responding to more negative story-lines emerging from problems within the car regime, however, car proponents were surprisingly nimble, as evidenced by their use of visions of electric cars and other incremental innovations. When seen in light of the railway journals’ promotion of motor transport around the turn of the century, this seems to suggest that for actors within a stable incumbent regime, it may be possible to recapture some of the open possibility-space enjoyed by niche innovations by promoting visions of a newer, or more improved version of the regime, even if this involves promoting radical niche innovations that might one day pose a threat. This tactic appears to be of only marginal use, however, as these kinds of visions had largely disappeared by the 1980s.

4.6.1. Introduction

Though they fall within the regime maintenance period, the years between 1990 and 2005 are given a separate section here because they illustrate the effect that a build-up of negative story-lines can have on an otherwise stable incumbent regime, and on the technologies competing with it. This period saw a slight reduction in the trends that were evident during the previous period. During the 1990s, the rate of increase in passenger-kilometres travelled by road increased slowly compared with the previous decades. The railways, on the other hand, saw a notable increase in total ridership (Figure 4.23). The 1990s also saw increasing political challenges to the car regime, as confrontational direct-action protests against the cars took place on motorway construction sites and on major...
London streets. The protesters’ concerns about pollution, accidents, urban degradation and climate change found their way into the policy arena in 1998, when John Prescott, now the Secretary of State for the Environment, Transport, and Regions, published a white paper titled *A New Deal for Transport: Better for Everyone* in 1998, followed in 2000 by a ten-year entitled *Transport 2010.*\(^{472}\) Both documents proposed measures such as congestion charging, office parking levies, and increased funding for the railways, in order to reduce the nation’s dependence on private cars.

The predominant anti-car story-line, portraying cars as an alienating system that threatened to pave over the entire country, persisted and grew in popularity during the 1990s. Positive story-lines about the railways, meanwhile, began to capitalize on the growing popularity of this story-line, and portrayed the railways as a greener and more human mode of travel. Proponents of motor transport, meanwhile, abandoned their previous visions of a cleaner, greener road transport system, and instead adopted defensive story-lines portraying motorists’ liberty as under threat by overzealous bureaucrats and naïve environmentalists.

This section will be handled differently from the others. Because it illustrates the effect of a popular story-line on political struggles and policy agendas, rather than covering the generation of new story-lines during a distinct period of a transition, it will present a single narrative considering the effects of story-lines about both rail and road transport, which by this time were closely entangled with each-other. This section also does not include a cultural landscape, because the cultural trends which are relevant for this struggle reflected largely the same concerns about technocracy and the environment which dominated criticism of the car regime during the previous period. Indeed, these developments intensified, as a new wave of environmentalists, frustrated with what they saw as the institutionalisation of the environmental groups of the 1960s and 1970s, increasingly embraced direct action tactics.\(^{473}\)

### 4.6.2. The Killer Cars versus a Rail Alternative

The negative story-line portraying cars as part of a pervasive and alienating system that threatens the British landscape and society motivated confrontational protests against motorway construction during the 1990s. Between 1992 and 1996, Protesters blockaded the intended routes of the M3 motorway through Twyford Down, as well as the Newbury Bypass, while a new activist group called Reclaim the Streets blockaded major London

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\(^{472}\) *Department for Transport 1998, Department for Transport 2000.*

\(^{473}\) *Merriman 2007, p. 207; Doherty, Paterson and Seel 2000, p. 1.*
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throughfares with street parties promoting a car-free society. These protesters produced few written texts, but the ones they did produce indicate that the protests were motivated by an anti-car story-line very similar to the one which developed during the 1970s. Posters promoting the protest groups referred to cars as “killer metal aliens [which have] colonised our streets and squashed us up against the wall. If we don't act quickly they will consume the city completely.” Spokespeople for the protesters argued for the return of streets “to human beings,” and called cars an “ecocidal nightmare”. A how-to book published by the protesters, entitled Road Raging, refers to a “stinking concrete car culture,” and speaks fondly of “a sense of community that has been all but lost to the pollution and danger of cars.” The common theme between all of these is that cars pose a mortal threat to both human and natural environments, threatening to replace them both with a polluted, concrete dystopia.

The road protesters received some mainstream support. Even right-wing newspapers such as the Daily Mail, and the Daily Express, which were mostly critical of the protesters, acknowledged the appeal of their story-line, conceding that “No one wants to see Britain asphalted over by ring-roads and motorways”, or that “Cars can be a curse, even when you are driving them”. The more left-leaning Guardian often called explicitly for curbs on car use in its coverage of the protests. Despite their radical tactics, the protesters enjoyed some qualified support from some marginal MPs, such as Harry Cohen, who described the M11 as a social and environmental disaster”, and John Denham, who expressed qualified sympathy to even the most radical anti-road protesters. They were also supported by Transport 2000, a moderate transport reform advocacy group which published dozens of letters to the editors of various papers arguing for measures such as railway investment, congestion charging, and a scaled-back motorways programme, in order to reduce the

474 Moran 2010, p. 203; Jeremiah 2007, p. 235
475 Williams, D., 1995, 'Protestors take to the streets to ban all cars', The Daily Express, 18 May, p. 59.
476 Ibid.
478 Road alert!, 1997
479 Ibid.
480 Daniels, A., 1996, 'To protest is fine, but why the squalor?' The Daily Mail, 12 February, p. 8.
481 Wheatcroft, G., 1996, 'Protesters take the highway to humbug', 22 January, p. 11.
483 HC Deb 11 March 1994 vol 239 cols 593-600.
country’s dependence on cars. Transport 2000’s director Stephen Joseph was a diplomat rather than a firebrand, but his letters to several newspapers indicate that he shared the road protesters’ guiding story-line. Joseph openly defended the road protesters in a 1994 letter to the editor of The Guardian, and co-signed another similar letter along with representatives of far more radical groups, such as Alarm UK and Friends of the Earth.

In a 2002 opinion piece, Joseph worried that the country was “being taken gently, but steadily, towards Los Angeles, where walking is practically illegal”. Despite these radical sympathies, however, Transport 2000 enjoyed a favourable hearing in the mainstream press. While they received some pushback, particularly in The Daily Mail, other newspapers frequently cited them as an authoritative voice on the subject of transport reform, indicating that worries about the long-term implications of the road regime were eliciting significant mainstream concern.

This mainstream concern is also evident in the British Social Attitudes Survey, which indicates growing opposition to road construction and support for alternative transport, throughout the 1990s. In the mainstream press, negative story-lines emphasizing problems with the road regime dominated the opinion journalism about cars, with dystopian visions of a nation paved over to create a ‘concrete nightmare’ accounting for 10 percent of the articles surveyed (Table 4.13). The road protesters, furthermore, received direct support from many decidedly non-radical members of the communities where they

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488 Joseph, S., 2002, ‘We do not have to be slaves to cars and roads’, The Times, 30 August, p. 20.


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were active; many of whom risked arrest and prosecution in order to support the protest
camps.492

<table>
<thead>
<tr>
<th></th>
<th>The Guardian (31)</th>
<th>The Times (30)</th>
<th>The Daily Mail (29)</th>
<th>All Newspapers (90)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic intelligence or road pricing.</td>
<td>0.13</td>
<td>0.23</td>
<td>0.10</td>
<td>0.16</td>
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<tr>
<td>Railways provide a useful alternative to roads.</td>
<td>0.29</td>
<td>0.13</td>
<td>0.03</td>
<td>0.16</td>
</tr>
<tr>
<td>Public transport provides a useful alternative to cars.</td>
<td>0.19</td>
<td>0.13</td>
<td>0.07</td>
<td>0.14</td>
</tr>
<tr>
<td>Air pollution.</td>
<td>0.06</td>
<td>0.13</td>
<td>0.17</td>
<td>0.13</td>
</tr>
<tr>
<td>Driving must be curbed.</td>
<td>0.13</td>
<td>0.13</td>
<td>0.03</td>
<td>0.10</td>
</tr>
<tr>
<td>Concrete nightmare.</td>
<td>0.13</td>
<td>0.10</td>
<td>0.10</td>
<td>0.10</td>
</tr>
<tr>
<td>Carnage on the roads.</td>
<td>0.13</td>
<td>0.07</td>
<td>0.10</td>
<td>0.09</td>
</tr>
<tr>
<td>The roads are dangerous.</td>
<td>0.00</td>
<td>0.17</td>
<td>0.10</td>
<td>0.09</td>
</tr>
<tr>
<td>Investment is needed in new roads.</td>
<td>0.03</td>
<td>0.13</td>
<td>0.03</td>
<td>0.07</td>
</tr>
<tr>
<td>Cars are a necessity.</td>
<td>0.03</td>
<td>0.00</td>
<td>0.10</td>
<td>0.05</td>
</tr>
<tr>
<td>History of cars.</td>
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<td>0.10</td>
<td>0.03</td>
<td>0.05</td>
</tr>
<tr>
<td>Careless motorists.</td>
<td>0.00</td>
<td>0.03</td>
<td>0.10</td>
<td>0.05</td>
</tr>
</tbody>
</table>

Table 4.13: The results of a quantitative content analysis of newspaper opinion articles about road transport from 1990 to 2005.

By the mid-1990s, these anti-car story-lines were being taken up by advocates of the railways. In 1995, Reclaim the Streets veterans partnered with the Railway Development Society to organize a series of sit-ins at railway stations to protest railway privatisation.493 RAIL, a new railway magazine founded in 1981 also adopted this story-line. Prior to the road protests, RAIL had avoided environmentalist story-lines, with the editor sometimes rebuking environmentalists for their opposition to railway developments.494 A 1990 editorial arguing for investment in the railways made no mention of the environmental or social impacts of motorways.495 By 1994, however, the magazine was openly supporting road protests, and even providing contact information for radical anti-motorway protest groups so that its readers could get involved.496 A 1993 editorial complained that “It's never too much trouble to build yet another motorway—nevermind the cost, destruction of the countryside, and encouragement of yet more pollution, but suggest a new railway and all hell breaks loose”.497 The use of this story-line by RAIL, a magazine aimed primarily at railway enthusiasts and businesspeople rather than environmentalists, suggests that it had

492 Cathles, 2000
become strategically useful to actors with a vested interest in promoting alternatives to the road transport regime. It was apparently fairly successful, as the value of this story-line was also reflected in the mainstream media coverage of railways. *The Guardian*, consistent with its support for the road protesters, supported railway investment in over a quarter of all the articles about the railways that were surveyed for the quantitative analysis (Table 4.1).

<table>
<thead>
<tr>
<th></th>
<th>The Guardian (29)</th>
<th>The Times (28)</th>
<th>The Daily Mail (28)</th>
<th>All Newspapers (85)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service complaints.</td>
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<td>0.29</td>
<td>0.32</td>
<td>0.21</td>
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<td>Safety concerns.</td>
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<td>0.25</td>
<td>0.18</td>
<td>0.14</td>
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<tr>
<td>Railways need new investment.</td>
<td>0.28</td>
<td>0.11</td>
<td>0.00</td>
<td>0.13</td>
</tr>
<tr>
<td>Railtrack is incompetently run.</td>
<td>0.17</td>
<td>0.14</td>
<td>0.00</td>
<td>0.11</td>
</tr>
<tr>
<td>History of the railways.</td>
<td>0.00</td>
<td>0.18</td>
<td>0.14</td>
<td>0.11</td>
</tr>
<tr>
<td>Privatisation was a mistake.</td>
<td>0.24</td>
<td>0.04</td>
<td>0.00</td>
<td>0.09</td>
</tr>
<tr>
<td>Comparisons with foreign railways.</td>
<td>0.03</td>
<td>0.07</td>
<td>0.14</td>
<td>0.08</td>
</tr>
<tr>
<td>Private rail companies are exploiting the taxpayer.</td>
<td>0.14</td>
<td>0.04</td>
<td>0.00</td>
<td>0.06</td>
</tr>
<tr>
<td>The railways are safe.</td>
<td>0.00</td>
<td>0.14</td>
<td>0.00</td>
<td>0.05</td>
</tr>
<tr>
<td>Labour issues.</td>
<td>0.00</td>
<td>0.00</td>
<td>0.11</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Table 4.14: The results of a quantitative content analysis of newspaper opinion articles about railways from 1990 to 2005.

A less dramatic version of this story-line also found its way into policy agendas. *A New Deal for Transport*, John Prescott’s white paper from 1998, uses problems such as climate change, air pollution, and car accidents to build a case for “a radical change in transport policy”, and argues that “simply building more roads is not the answer to traffic growth”. The white paper does not wholeheartedly embrace the anti-car story-line, and reassures drivers that the Labour party has a “vision for a prosperous Britain where prosperity is shared by all we expect more people to be able to afford a car”. The list of concerns cited by the report, however, represent a disaggregated version of the same story-line used by the road protesters. Prescott references all the same motivations as the more radical activists, but strips them of their apocalyptic interpretation, which might have scared off more moderate voters. Nevertheless, the report aggressively promotes alternatives to driving, including what it calls “a railway renaissance.” A *Guardian* editorial about the report suggested that while Prescott was no radical environmentalist, his use of concerns about road transport was a smart political move: “The Jaguar-driving Prescott is not anti-car. Like the motoring organisations he is swimming with the Zeitgeist by admitting that the car has to be saved

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498 Department for Transport 1998, p. 2
499 Ibid.
500 Department for Transport 1998, p. 5.
The evolution of discursive story-lines during socio-technical transitions from itself. It is unlikely that Prescott would ever have been seen at a road protest, or even at a Transport 2000 meeting. His recommendations, meanwhile, were largely left unimplemented and forgotten by the mid-2000s. The fact that A New Deal for Transport was seen as politically viable by a relatively centrist Labour government, however, indicates that the popularity of anti-car story-lines was shaping policy agendas around transport, even if the government pushing the new agendas could not itself wholeheartedly embrace the story-line.

By the middle of the 1990s, the motor press perceived this story-line and its proponents as a serious threat and, and had begun to push back against them. In the inaugural issue of Top Gear Magazine, published in 1993, columnist and TV personality Jeremy Clarkson described car use as a kind of rebellion against the nanny-state: “Cars are irresponsible, environmentally unsuitable, noisy, and dangerous. Cars are as daft as unprotected sex but who wants to use a condom?” Other British car magazines were still promoting visions of green cars at this point, but by 1998 they had also adopted Top Gear’s tone. That year, the correspondence page of Car hosted a spirited debate about climate change, in which measures to curb emissions were cast as a threat to “our freedom to use cars.” While there were letters taking positions both for and against the existence of manmade global warming, the editor of the magazine showed his bias by awarding “letter of the month” to two letters espousing a denialist position. Columnists in Autocar and Motor also portrayed Prescott’s plans as authoritarian impositions on motorists (Figure 4.24), advocated the construction of more motorways, and praised a well-financed campaign “to promote motoring freedom”. In Top Gear, Clarkson’s response to Prescott’s agenda was characteristically blunt: “He wants more trains, more buses, and more pedestrianisation, and he wants us to pay for it. Well he can f*** off.”

503 Dudley and Chatterjee, 2011.
This story-line about a meddling bureaucracy, supported by clueless environmentalists, oppressing motorists’ freedom, was also deployed against railway advocates. Recounting his experience of bad service on a train journey from London to Manchester, for example, Daily Mirror motoring correspondent Quentin Wilson, concluded that “Given the current state of the railways, I'm afraid to say I'd rather sit in a traffic jam. So whenever some anti-car evangelist gives me the sermon about rail travel being a practical alternative, I walk away.”

The story-line about chaotic, unpunctual and uncomfortable railways was also seen in the mainstream press, where complaints about the state of service on the railways appeared in 21 percent of all articles surveyed for the quantitative analysis (Table 4.13). As story-lines promoting incremental reforms to the car regime lost ground, motor regime actors began developing new story-lines, relying on cultural narratives of state oppression, as well as experiential frustrations with poor railway service, in order to defend the road regime from its critics. There are parallels between this and story-lines promoted by railway magazines in the 1920s, as they attempted to condemn the growing road regime as unsafe: In both cases, representatives of the dominant regime rely on empirical credibility and experiential commensurability to position themselves as superior to a less dominant system.

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512 Wilson, Q., 1998, 'Train trip left me far from chuffed', The Daily Mirror, 13 November, p. 25.
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In 2000 and 2001, these story-lines contributed to a grassroots backlash against Labour's transport reforms. Supporters of the road regime used their own direct action tactics, as hauliers blockaded motorways and fuel refineries in protest against the government’s transport policies. Despite their disruptiveness, these blockades received considerable mainstream support, most notably in the Daily Mail, which described the protests as a people’s rebellion against an oppressive and out-of-touch bureaucracy, and the “immense influence wielded by a small, metropolitan clique of unelected cronies whose lifestyle and attitudes are utterly remote from those of the great majority of the public.” This backlash derailed Labour’s transport reforms during the early 2000s. This illustrates that story-lines supporting a dominant regime can have a stabilizing effect, but it is notable that in this case, the most prominent story-line in the backlash was reactive, created in response to anti-car story-lines and the policies they inspired. This reactive quality is also found in the story-lines which defended the British railways at the turn of the twentieth century, and may indicate that the most effective pro-regime story-lines are not the long-standing story-lines that have existed since the formation of the regime, but instead are reactive ones, created in response to the contingencies of the moment.

4.6.3. Conclusion

The anti-car story-line was influential during this period, but only to a point. While it was able to generate protests and to motivate John Prescott to publish A New Deal for Transport and Transport 2010, it could not by itself ensure the success of those policies, especially as these ran up against major opposition from the car regime, which developed an effective counter story-line. This supports the view that the primary power of activist groups lies in their ability to set agendas and frame issues, but that their ability to actually change policy is limited. This period also demonstrates that anti-regime story-lines can be very useful for actors promoting competing systems, as evidenced by RAIL’s adoption of environmentalist story-lines. While this period suggests that negative story-lines about an incumbent regime can spur public debate, however, it also suggests that they are unable to effect significant change unless the regime is also challenged by other developments besides discourse.

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513 Dudley and Chatterjee 2011, p. 95
516 Jeremiah 2007, p. 236.
517 Johnson, Agnone and McCarthy 2010.
4.7. Conclusion to the British Case Study

The theoretical implications of this case study cannot be systematically evaluated until they can be compared with the American case study. When considered in isolation, however, each period discussed in this chapter has some interesting theoretical implications. These are briefly summarized below.

Period 1: Legitimation (1896-1918). The railways’ struggle against their critics during this period demonstrates that an incumbent regime can face ongoing struggles. The response of the actors within the railway regime, meanwhile, indicates the importance of empirical credibility as a discursive resource for actors supporting an incumbent regime. This period also demonstrates that legitimation struggles over niche technologies can encourage negative story-lines about them, such as the one portraying cars as dangerous upper-class nuisances. The use of a vision of affordable cars by actors within the motor niche to respond to negative story-lines casting cars as an element of class conflict is a particularly interesting finding. It underlines the role of visions in allowing niche actors to flexibly respond to the cultural landscape.

Period 2: Stabilization (1918-1945). Story-lines during this period emphasized intensifying problems within the car niche, such as a growing accident rate and rural blight. As the analytical model predicts, these problems were used by railway actors to build an empirical case for the railways as a superior transport system. The analytical model did not, however, predict that these same problems would also be used by motor transport actors to develop story-lines in favour of new roads and traffic laws. The implications of this mismatch will be discussed in detail in the concluding chapter.

Period 3: Contestation and Overthrow (1945-1963). Enthusiastic visions of a rejuvenated railway system or of a “motor age” during this period both attempted to link up with post-war high modernism. This underscores the importance of narrative fidelity as a crucial deciding factor for discursive conflict during the tipping point of a transition. The political impact of positive story-lines portraying motorways as modern marvels, and negative story-lines portraying railways as Victorian relics shows that story-lines can have a real effect on transitions: Were it not for these story-lines, it is unlikely that the motorways would have had so much more political appeal than the railways. One interesting observation from this phase which is not predicted in the analytical model is the near-total absence of any anti-
motorway story-line. This suggests that challenger regime discourses might be very strong during the third phase, possibly because they combine the credibility that comes with an increasingly mature system with the enthusiastic visions that are applied to an immature one.

**Period 4: Regime Maintenance (1963-2005).** Actors supporting the car regime during this period were surprisingly supportive of radical innovations to improve it, including electric cars and new public transport systems. This mirrors railway actors’ support of road transport during the first period, and suggests that even fairly radical visions be strategically repurposed by supporters of an incumbent regime in order to deal with unsolved problems within the regime. The role of anti-car story-lines in setting political agendas during the epilogue illustrates some of the practical implications of story-lines that are harshly critical of an incumbent regime. The fact that these agendas were largely not implemented, however, illustrates that even a widely maligned regime can be very resistant to change.

This case study reproduces the general pattern proposed by the conceptual model: As technologies move from a niche to a regime, they rely less on enthusiastic visions of the future, and more on their proven track record. As the systems built around a new technology become more concretely visible, however, so do its problems. Early car supporters used visions of the future to build support, while the dominant railway regime faced negative story-lines related to ongoing complaints about its performance. Having replaced the dominant railway regime in 1963, the motor regime also replaced it as a target of criticism, with complaints about the road regime empowering story-lines supporting alternatives, including a revived railway regime. Defenders of the motor transport regime, meanwhile, portrayed it as the most stable and reliable system. This inversion, in which road transport moved from being a radical alternative to being a reliable and credible system, while rail transport did the opposite, supports the general theoretical logic of the analytical model.
Chapter 5: American Case Study

5.1. Introduction

This chapter discusses the development of story-lines about road and rail transport in the United States during the twentieth century (Figure 5.1, Figure 5.2). As with the previous chapter, this discussion is broken up into four periods corresponding to the four phases of the analytical model. Unlike the British case study, there is no epilogue period, since the era of protest and new policy agendas which are discussed in that section never occurred in the United States. The timing and key events of each period are discussed below.

Period 1: Radical Novelty (1887–1910) This period began in 1887, when Congress passed the Interstate Commerce Act; the first in a series of Federal railway regulations which would be a consistent impediment for the railways as they attempted to compete with the growing threat of road transport. As in the British
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case, early American cars were mainly recreational vehicles for the wealthy,\textsuperscript{518} and faced struggles over early problems such as accidents. Cars gained legitimacy and popularity much faster in the United States, however, meaning that this period is much shorter than its British counterpart, ending in 1910.

**Period 2: Stabilization (1910-1929).** By 1910, American cars had become available to the middle classes, and American cities and states had begun to accommodate cars by building new roads and passing new traffic laws\textsuperscript{519}. The railways continued to struggle against increasingly stringent regulations. When they were returned to the private sector after the First World War, they were saddled with strict controls on their fares, rates, and profit margins. Facing increasing competition from the roads, railways began to suffer serious financial difficulties as their passenger and freight traffic declined in the late 1920s. By the time the stock market crashed in 1929, they were becoming desperate.

**Period 3: Contestation and Overthrow (1929-1945)** The railways continued to struggle against road competition during this period; a struggle which was difficult due to the fact that the regulations which restricted their business practices did not apply to the road transport sector. A political struggle ensued, as the railways attempted to lobby for greater regulation of the road transport industry. This resulted in only a partial victory, as only very weak regulations were imposed on the road transport industry in 1935. Road transport, in the meantime, consolidated its advantage over the railways, as public road building programmes proliferated across the country—a development which went virtually unchallenged. By the outbreak of the Second World War, the roads’ advantage was decisive.

**Period 4: Regime Maintenance (1945-2001)** After the end of wartime rationing, the American railways declined rapidly, while the Federal Government built the country’s interstate highway network, and private cars became the norm for passenger transport in the United States. In 1970, in order to avoid its complete collapse, passenger rail travel was handed to Amtrak—a subsidised government corporation. Critics of the road regime became more vocal during this period, calling attention to problems such as pollution, accidents, urban decay, and fuel shortages. This period ends with the election of President George W. Bush in 2001:

\textsuperscript{518} Shcharff 1991, p. 9.
\textsuperscript{519} Gartman 2004, p. 172.
An endpoint which has been chosen to avoid covering any history which remains politically controversial in the present day.

The structure of each section in this chapter is the same as in the previous chapter: A brief introduction to each period summarizes the important events, struggles, and story-lines. This is followed by an account of the cultural landscape, which emphasizes the cultural developments most relevant to the transition. Next, separate sections on the history of road and rail transport discuss the dominant positive and negative story-lines pertaining to each transport system. Finally a concluding section considers the implications of each period for the analytical model.
5.2. Period I: Radical Novelty (1887-1910)

5.2.1. Introduction

By the turn of the twentieth century, American railway companies had completed the core of their networks, and had begun to amalgamate into larger railway organisations, or create rate agreements between themselves, in an attempt to avoid fighting rate wars. This was a major concern for passengers, freight shippers, and policymakers alike, as American railways had been developing a reputation for monopolism and exploitation of their customers since the 1870s. Many commentators worried that the amalgamations would only strengthen this trend, and this encouraged a legislative agenda designed to protect the railways’ customers. In 1887 Congress passed the Interstate Commerce Act, creating the Interstate Commerce Commission, a new government agency which was given a mandate to supervise railway rates. This commission was initially under-resourced and largely impotent against the railways, and so it was strengthened in 1906 by the Hepburn Act, which empowered it to set maximum rates for the railways. Railway regulations would become increasingly strict from this point onwards.

Figure 5.3: The number of state registrations of motor vehicles, 1900-1910. Data from Flink, 1970, pp. 58-59. Note that this data is somewhat imprecise due to inconsistencies in state registration policies and inconsistent records. There is also no available data on railway traffic from this period.

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521 Kerr 1973, p. 8
523 Kolko 1965, p. 53
The American car’s period of radical novelty was brief, compared to that of its British counterpart. While cars remained confined to a small recreational niche prior to 1910, they rapidly became more popular (Figure 5.3), and by 1908 city and state governments were already building new roads to facilitate motor traffic. Cars remained controversial, however, as struggles over problems such as frightened horses, noise, dust, and accidents developed into local political battles over issues such as the rights of motorists to use public parks.

Positive story-lines about the railways during this period portrayed emphasized some of the railways’ technical accomplishments and economic contributions. Dominant negative story-lines about railways portrayed their managers as greedy, abusive monopolists. Railway actors dismissed these critics as uninformed. Positive story-lines about cars, meanwhile, portrayed them as a progressive, exciting, and useful innovation, while negative story-lines condemned them as impractical and dangerous.

5.2.2. The Cultural Landscape

Negative story-lines about the railways enjoyed considerable support from the cultural landscape during this period. Since the 1870s, movements such as the Grangers, the Farmers’ Alliance, and the Populist Party had been building popular opposition to what they saw as monopolistic special privileges of the banks, land syndicates, manufacturers, and, perhaps especially, the railways. While these movements were declining by the 1890s, their legacy in the early twentieth century was a widespread suspicion of amalgamated business interests. The railways were some of the country’s largest and most established business interests, and had been accused by populists and grangers of profiteering off of farmers. This made them a target for this suspicion during this period.

The 1893 Chicago World’s Fair, which proclaimed a bright technological future for the country, illustrates another important cultural trend during this period, namely the enthusiasm for technological progress. The fair had a near-universal appeal, and was praised by even some of the most radical critics of industrialism, such as socialist

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525 McShane 1994, p. 190.
527 Flink 1970, p. 179.
528 McMath 1993.
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leader Eugene Debs. As new and rapidly improving technology, cars were ideally positioned to take advantage of this enthusiasm.

5.2.3. Debates over the Railway Trusts

Positive Story-Lines

A quantitative analysis of opinion journalism from this period reveals that most positive story-lines about the railways during this period were reactive rather than proactive: While 8 percent of the articles surveyed defended the railways from their critics (who will be discussed below), only a small proportion expressed positive story-lines about the railways that were not in response to a pre-existing controversy (Table 5.1).

<table>
<thead>
<tr>
<th></th>
<th>Boston Globe (20)</th>
<th>Chicago Tribune (20)</th>
<th>Los Angeles Times (20)</th>
<th>New York Times (20)</th>
<th>Washington Post (20)</th>
<th>All Newspapers (100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accidents or Safety Concerns</td>
<td>0.15</td>
<td>0.1</td>
<td>0.25</td>
<td>0.25</td>
<td>0.2</td>
<td>0.19</td>
</tr>
<tr>
<td>Support for Railway Regulations.</td>
<td>0.2</td>
<td>0.15</td>
<td>0.2</td>
<td>0.1</td>
<td>0.05</td>
<td>0.14</td>
</tr>
<tr>
<td>Railway companies are negligent on safety.</td>
<td>0.1</td>
<td>0.1</td>
<td>0.05</td>
<td>0.15</td>
<td>0.05</td>
<td>0.09</td>
</tr>
<tr>
<td>Defence of railway companies.</td>
<td>0.1</td>
<td>0.1</td>
<td>0.05</td>
<td>0</td>
<td>0.15</td>
<td>0.08</td>
</tr>
<tr>
<td>Complaints about fares or freight rates.</td>
<td>0</td>
<td>0.05</td>
<td>0.25</td>
<td>0.05</td>
<td>0</td>
<td>0.07</td>
</tr>
<tr>
<td>Economic Contributions of Railways.</td>
<td>0.1</td>
<td>0.1</td>
<td>0.05</td>
<td>0</td>
<td>0.05</td>
<td>0.06</td>
</tr>
<tr>
<td>Labour issues.</td>
<td>0.1</td>
<td>0.1</td>
<td>0.05</td>
<td>0.05</td>
<td>0</td>
<td>0.06</td>
</tr>
<tr>
<td>Train robberies.</td>
<td>0.05</td>
<td>0.1</td>
<td>0.05</td>
<td>0.1</td>
<td>0</td>
<td>0.06</td>
</tr>
<tr>
<td>Service complaints.</td>
<td>0.05</td>
<td>0.05</td>
<td>0.1</td>
<td>0.05</td>
<td>0</td>
<td>0.05</td>
</tr>
<tr>
<td>Anti-amalgamation.</td>
<td>0.05</td>
<td>0.15</td>
<td>0.05</td>
<td>0</td>
<td>0</td>
<td>0.05</td>
</tr>
<tr>
<td>Railway structures as engineering marvels.</td>
<td>0.1</td>
<td>0</td>
<td>0</td>
<td>0.05</td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td>Praise of railway development.</td>
<td>0.1</td>
<td>0</td>
<td>0</td>
<td>0.1</td>
<td>0.1</td>
<td>0.04</td>
</tr>
<tr>
<td>Reference to widespread opposition to railway rates.</td>
<td>0.05</td>
<td>0.1</td>
<td>0</td>
<td>0</td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td>Defence of railway amalgamations.</td>
<td>0.05</td>
<td>0</td>
<td>0</td>
<td>0.15</td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td>The railways are dangerous.</td>
<td>0.1</td>
<td>0.05</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.03</td>
</tr>
<tr>
<td>Technical discussions.</td>
<td>0.1</td>
<td>0</td>
<td>0.05</td>
<td>0</td>
<td>0</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Table 5.1: The results of a quantitative content analysis of newspaper opinion articles about railways from 1887 to 1909.

The proactive positive story-lines that did exist portrayed the railways as an ingeniously engineered system that was central in the country’s economic prosperity. Six percent of the articles surveyed for the quantitative analysis emphasize the economic benefits of the railway system, while four percent describe new railway developments as engineering marvels. The *Boston Globe*, likely due to its editorial emphasis on sensationalism, provides an exaggerated example of these story-lines in its description of a new railway line which island-hopped across the Straits of Florida to connect the mainland with the Florida Keys: “When this novel project was attempted it was deemed a rash and impossible undertaking, but all the difficult engineering problems have been solved. When this road opens for business it is destined to have a marked influence on the commerce of the Atlantic coast.” Railway developments which could be described as engineering marvels were relatively rare, meaning that newspapers had few opportunities to promote that storyline. The economic story-line, however, appeared consistently in many fora. In 1908, the editor of the *Railway Gazette* argued that “A new country in which most of the people are landholders will favour whatever policy gives most railroads and gives them most quickly.” Mann-Elkins act sponsor and soon-to-be Republican house minority leader J.R. Mann was quoted in the *Washington Post* as saying that “The modern industrial, commercial, social, and intellectual life depends to a large degree for its success, its usefulness, progress, and its beneficence, on the railways.”

This economic story-line was made more tenable by the lack of any viable alternative to the railways. Motor transport, as will be discussed in section 5.2.4, was not yet credible as a means of intercity transport, and so most commentators prior to 1910 assumed that the future of transport would feature improved railways. Explicit coverage of technological developments on the railways was rare, but the *New York Times*, *The Boston Globe*, and the *Washington Post* all published articles expressing an interest in electric traction. The lack of any perceived alternative to the railways added empirical credibility to the story-line portraying them as synonymous with commerce and prosperity.

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The evolution of discursive story-lines during socio-technical transitions

Negative Story-Lines

A far more popular story-line about the railways portrayed them as a dangerous and exploitative system, irresponsibly run by greedy monopolists. This story-line was connected to widespread complaints about the railways’ business practices, all of which show up prominently in the quantitative content analysis. The most prominent of these was safety. Accidents and safety concerns were the most common theme in opinion journalism about the railways, and 9 percent of the articles and letters surveyed concluded that they were at least partly the fault of negligent railway managements who skimped on safety precautions in order to increase their profit margins (Table 5.1). As with the positive story-lines about engineering marvels, this story-line was most dramatically expressed in the sensationalist Boston Globe, whose editor, reflecting on an 1887 accident in which several passengers had burned to death, bitterly noted that “It would almost seem that the railroad managers meant to guard every avenue of escape for passengers in case of accident, and to make sure that, if the wrecked cars were not set afire by unsafe stoves, petroleum from the lamps might be depended upon to inaugurate the lurid feast of flames”.

Another popular complaint about the railroads, appearing in 7 percent of opinion coverage, had to do with the fares and rates they charged passengers and freight shippers. This complaint dates back to the populist and granger eras, when agitation against railway rates created a short-lived yet popular political movement. It was disproportionately found in the Los Angeles Times, where it appears in a quarter of all opinion articles about the railways, with commentators accusing railway managers of strangling national commerce and exploiting the travelling public. In the run-up to the passage of the Hepburn Act, the editor of the Times even argued that “Railroads are public utilities and not to be treated as a private business”. This story-line may have been more resonant in Los Angeles due to its remoteness from Eastern industrial centres and consequent dependence on the railways. This would have amplified the importance of the railways’ policies, and increased the empirical credibility and experiential commensurability of story-lines complaining about the economic impacts of high railway rates.

542 McMath 1993, p. 146
A third complaint, which appears in five percent of the articles surveyed in the quantitative analysis, emphasizes poor service on passenger lines, with commentators complaining about issues such as limited space, ventilation, or heat in the coaches, bad food in the dining cars, and inconvenient ticketing practices.\(^{545}\) There was a widespread sense that railway managers had no intention to address these problems, because they simply were not interested in the satisfaction of their customers. One \textit{Los Angeles Times} editorial, making several suggestions about how to improve railway ticketing practices, concluded on the cynical note that “Such suggestions as these, coming from an outsider, will doubtless be received from the railway fraternity with the same contemptuous sneer that sometimes awaits the ‘layman’ who is so presumptuous as to suggest to a hidebound physician that the best way to treat disease is to remove the cause.”\(^{546}\)

These complaints about safety, rates, and service quality lent empirical credibility and experiential commensurability to a negative story-line about the railways. Railway critics linked this story-line to populist distrust of large companies, creating a highly resonant story-line portraying railway managers as careless, monopolistic, and exploitative profiteers.\(^{547}\) The railways therefore became a common target in the agitation against business trusts which was a common feature of economic journalism during this period.\(^{548}\) Editorial cartoons from this period often portrayed railway managers as rotund, greedy men in top hats cheating the travelling public (Figure 5.4). The editor of the \textit{New York Times} complained in 1888 that “Practices which in a bank or ordinary mercantile business, still more in relations of special trust, would be regarded as dishonourable and even criminal, are excused in railroad management as if they were matters of necessity.”\(^{549}\) The fact that this view was expressed by the editor of the \textit{New York Times} is notable, as the \textit{Times} during this period, far from being a sensationalist newspaper, cultivated an image which emphasized its “conservatism, decency, and accuracy”,\(^{550}\) and appealed to an audience that included many businesspeople. The fact that the editor of the \textit{Times} would give voice to such a harsh indictment of railway managements is therefore a powerful testament to the appeal of this story-line.

\(^{548}\) Emery 1972, p. 382  
\(^{550}\) Schudson 1978, p. 110.
The resonance of this story-line in a political climate that was harshly critical of industrial trusts is illustrated by its prominence in the staunchly anti-trust newspaper, the Chicago Tribune, where it accounts for 15 percent of the articles surveyed (Table 5.1). The editor of the Tribune frequently criticized the railways, at one point describing them as one of the worst examples of an economic trend by which “Great corporations monopolize the production of all the comforts and many of the necessities of life”, and which it named as one of the great dangers of the twentieth century. In 1900, the Tribune quoted M.L. Lockwood, President of the American Anti-Trust League, as he argued for railway nationalisation on the grounds that “Thirty years of railway discrimination has enabled a few men to monopolize nearly all the developed resources in this great land...The people

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551 Emery 1972, p. 400.
are going to take the railways away from these corporations”. Popular anti-trust attitudes generated considerable narrative fidelity for negative story-lines such as this one.

This view that the railways should be taken away from private industry was common among the railways’ critics. A 1905 Letter to the Editor of the Baltimore Sun argued that one of the best outcomes of railway nationalisation in Switzerland and New Zealand had been the elimination of highly-paid managers. This attitude also appears in Jesse Hardesty’s 1899 book, *The Mother of Trusts: Railroads and their Relation to the Man with the Plow*, whose title implicitly agrees with the *Chicago Tribune*’s assertion that the railways represented the absolute worst of industrial amalgamation. The final chapter of the book emphasized the virtues of nationalization:

> The evils attending corporation ownership of the public highways having become unbearable, a speedy remedy for the relief of people is necessary. It is in the power of those who will be benefited in the greatest degree to put an end to the private control of the public roads. The farmer, the manufacturer and the laborer are those who will derive the greatest benefit from public ownership and control of the railroads, for they are the greatest sufferers under corporation control of the roads.

“The Man with the Plow” was an important character in these debates. Farmers were consistently portrayed as the victims of the railways’ worst abuses. As will be discussed in section 5.2.4, this provided an important opening for car advocates, who were able to position the early automobile as an important asset for farmers.

Congressional debates over railway legislation illustrate that American democratic narratives provided another source of narrative credibility for this negative story-line. In Congress, railway managers were referred to as tyrannical, unelected despots who were subverting American democracy. Many Congresspeople described railway rates as a covert tax on the nation’s commerce. Senator Wilkinson Call complained that the railways had “a greater right of taxation without representation of the people, without responsibility to them, a power which in fact takes from them a greater sum of money than that drawn by the National Government and the state governments”. It is unsurprising that Call, an agrarian populist Democrat, would take this view, but it was shared by other politicians

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555 Hardesty 1899, p. 251.
557 Schlup and Ryan 2003, p. 76.
The evolution of discursive story-lines during socio-technical transitions with other backgrounds, such as Kansas Republican John A. Anderson, and prominent Texas Senator and former Texas Governor Richard Coke.\footnote{Annals of Congress, 49th Cong., 2nd sess., 526; Annals of Congress, 49th Cong., 2nd sess., 852.}

This version of the story-line also frequently made reference to the railways’ exertion of political power, which some in Congress described as a direct challenge to the ideals of the American republic. Illinois Representative Johnathan Rowell, for example, argued that “The city is to-day swarming with keen, zealous, able agents of railroad power trying to defeat the passage of this bill. Every vote cast at their dictation and every vote cast against this bill is a vote for railroad supremacy and against the people”.\footnote{Annals of Congress, 49th Cong., 2nd sess., 857.} Prominent democratic representative William McAdoo argued that this state of affairs would be made worse by pooling arrangements which would mean that “five or six men who control these great trunk lines which traverse the continent can, by meeting and confederating together, fix the price of the necessities of life, which you in the West raise to be consumed by our people in the East”.\footnote{Annals of Congress, 49th Cong., 2nd sess., 861.} During the debates over the Hepburn Act, Senator Asbury Latimer complained that just seven corporations controlled most of the country’s railways, and argued that this threatened “the elimination of competition and the placing of despotic power in the hands of a few men.”\footnote{Congressional Record. 59th Congress, 1st session, 5247.} Several other senators and representatives also espoused this view.\footnote{Congressional Record. 59th Congress, 1st session, 3920.; Congressional Record. 59th Congress, 1st session, 4059.} In Congress, the negative story-line portraying railways as exploitative monopolies gained narrative fidelity from the American mythology of popular revolt against unjust taxation, which cultural scholar James Robertson describes as a “charter myth” of the country.\footnote{Robertson 1980, p. 56} By re-framing railway rates as a tax, it was possible to use this narrative in a commercial context, rather than just a political one. This illustrates the potential creativity of actors as they draw on cultural narratives to build narrative fidelity for their story-lines.
The most prominent exponent of these views was President Theodore Roosevelt, who developed a reputation for challenging the railways (Figure 5.5). Roosevelt’s first prominent condemnation of the railways occurred during his 1905 annual message, when he argued for regulatory action against unreasonable railway rates. From that point on, Roosevelt would mention the problem of railway trusts in virtually every speech he gave. Some of these speeches were quite dramatic. In 1907, Roosevelt accused the railways of

Swindling in stocks, corrupting legislatures, making fortunes by the inflation of securities, by wrecking railroads, by destroying competitors through rebates—these forms of wrongdoing in the capitalist, are far more infamous than any ordinary form of embezzlement or forgery; yet it is a matter of extreme


difficulty to secure the punishment of the man most guilty of them, most responsible for them.\textsuperscript{566}

Roosevelt even went so far as to propose a vision of an alternative transport system, consisting of an elaborate system of interior waterways which would connect the Great Lakes basin with the Mississippi basin, allowing travellers and farmers to avoid the worst of the railways’ abuses. This system, Roosevelt argued, would constitute the “extension of our coast line into the very heart of our country. It would be of incalculable benefit to our people. If begun at once it can be carried through in time appreciably to relieve the congestion of our great freight-carrying lines of railroads”\textsuperscript{567}

Despite his rhetoric, however, Roosevelt gave no special legislative attention to the problem of railway pooling until several years into his presidency.\textsuperscript{568} It is therefore possible that, as historian Gabriel Kolko argues, Roosevelt’s speeches were a cynical attempt to placate the railways’ critics while Roosevelt collaborated behind the scenes with the railways to protect them from an angry public, rather than vice-versa.\textsuperscript{569} This, however, would still indicate that negative story-lines about the railways had become popular enough to shape policy agendas, just as negative story-lines about roads would shape policy agendas for the British Labour government a century later. Some railway companies and magazines attempted to use these new agendas to their benefit, rather than try to fight against them. Charles S. Mellen, of the New Haven Railroad, for example, said that “A public must be led, but not driven, and I prefer to go with it and shape or modify, in a measure, its opinion, rather than be swept from my bearings with loss to myself and the interests in my charge.”\textsuperscript{570} Similarly, the Railroad Gazette observed “a strong public feeling against corporations in general and the railroads in particular [which] cannot be disposed of by a policy of doing nothing”.\textsuperscript{571} The railways scored some victories in the regulatory struggles of this period, particularly as early railway regulations helped them to avoid rate


\textsuperscript{569} Kolko 1965, p. 107.

\textsuperscript{570} Kolko 1965, p. 116.

\textsuperscript{571} Kolko 1965, p. 143.
wars. Whatever the ultimate effect of the railway regulation policy agenda, however, actors at the time appear to have agreed that it was largely shaped by popular animus against the railways.

Defensive Story-Lines

Railway supporters’ response to these negative story-lines in the United States was very similar to that of their British counterparts, portraying the railways as a competently run system that was unfairly under siege by a fickle and ignorant public and political class, who did not understand the complexities of running a railway. In 1900, for example, the editor of the *New York Times* argued that “any fair-minded man who studies the facts of railroad operation must perceive that the problem of the regulation of rates that will be equitable between the roads and the public is highly complex and difficult”. This could be reflective of the Times’ conservatism, as it was a rare perspective in other newspapers, but it did frequently appear in the *Railway Gazette*, which in an 1887 editorial on the Interstate Commerce Act complained that

The national representatives hasten at the beck of a general clamor against the railroads, like the granger agitation some years ago, to turn this hastily digested scheme loose upon the business interests of the country…it may be presumed that the president will sign the Interstate Commerce Bill, in spite of its deficiencies, as being the expression of a loudly expressed popular opinion.

In 1906, the *Gazette* was more optimistic, attributing some legislative decisions that were favourable to the railway sector to an American public who “have learned infinitely more about their railroads than they ever knew before—a knowledge which seems quite certain to allay the unmistakable hostility towards the railroad corporations that was coming to look like a dangerous element in the national politics”. The article goes on to draw on existing positive story-lines about the railways’ engineering triumphs, such as the railway to the Florida Keys, and the Chicago Freight Tunnels.

While the railways’ defenders were in many cases able to hold the line against their critics, their critics, benefiting from a popular negative story-line portraying the railways as a monopolistic threat to American democracy, held the initiative. This story-line gained narrative fidelity from its connection with contemporary populist and anti-trust movements, as well as from long-standing American democratic narratives. It also gained empirical credibility and experiential commensurability from widely-shared frustrations.

572 Kolko 1965, pp. 45-46.
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about railway service and concerns about railway safety. Positive story-lines about the railways, which typically emphasized engineering triumphs or railway actors’ expertise, failed to gain similar resonance, partly because of the badly eroded actor credibility of railway actors, who were durably associated with monopolism and graft, in a time when public concerns about monopolism and graft were at a high point.

5.2.4. The Legitimation of the American Automobile

Positive Story-Lines

In 1895, widespread media coverage of a Paris-Bordeaux motor race generated “an aura of optimism about the automobile”, which inaugurated American public discussion about road transport. According to the quantitative content analysis, the dominant positive story-line contributing to this optimism was pragmatic. 20 percent of the articles surveyed portrayed cars as an increasingly useful or reliable technology (Table 5.2). Many of these articles mentioned new uses for motor vehicles, as mail gatherers, motorized buses, or street sweepers. Car advertisements from this period combined this emphasis on reliability with a portrayal of cars as adventure machines, calling attention to cars’ performance over difficult terrain (Figure 5.6). This combination of story-lines about reliability with story-lines about adventure and excitement also featured prominently in the discourses around the large number of races, reliability trials, and transcontinental drives which occurred during this period, in which car manufacturers competed to establish basic confidence in their machines.

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Figure 5.6: A Cadillac Advertisement showcasing the cars' practical capabilities.

### Table 5.2: The results of a quantitative content analysis of newspaper opinion articles about road transport 1887 to 1909.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cars portrayed as reliable or useful.</td>
<td>0.40</td>
<td>0.14</td>
<td>0.11</td>
<td>0.05</td>
<td>0.22</td>
<td>0.20</td>
</tr>
<tr>
<td>Reckless drivers.</td>
<td>0.10</td>
<td>0.21</td>
<td>0.22</td>
<td>0.05</td>
<td>0.17</td>
<td>0.14</td>
</tr>
<tr>
<td>Opposition to strict regulation of cars.</td>
<td>0.25</td>
<td>0.07</td>
<td>0.11</td>
<td>0.05</td>
<td>0.00</td>
<td>0.10</td>
</tr>
<tr>
<td>Rail-road coordination.</td>
<td>0.20</td>
<td>0.07</td>
<td>0.11</td>
<td>0.00</td>
<td>0.06</td>
<td>0.09</td>
</tr>
<tr>
<td>Cars portrayed as progressive or exciting</td>
<td>0.10</td>
<td>0.07</td>
<td>0.11</td>
<td>0.10</td>
<td>0.06</td>
<td>0.09</td>
</tr>
<tr>
<td>Support for strict regulation of cars.</td>
<td>0.10</td>
<td>0.14</td>
<td>0.11</td>
<td>0.00</td>
<td>0.11</td>
<td>0.09</td>
</tr>
<tr>
<td>Cars are dangerous.</td>
<td>0.05</td>
<td>0.07</td>
<td>0.00</td>
<td>0.15</td>
<td>0.11</td>
<td>0.09</td>
</tr>
<tr>
<td>Widespread car use encourages road improvement.</td>
<td>0.10</td>
<td>0.00</td>
<td>0.11</td>
<td>0.00</td>
<td>0.17</td>
<td>0.07</td>
</tr>
<tr>
<td>Cars contribute to the economy</td>
<td>0.15</td>
<td>0.00</td>
<td>0.11</td>
<td>0.00</td>
<td>0.11</td>
<td>0.07</td>
</tr>
<tr>
<td>Motor transport necessitates new roads.</td>
<td>0.05</td>
<td>0.07</td>
<td>0.00</td>
<td>0.05</td>
<td>0.11</td>
<td>0.06</td>
</tr>
<tr>
<td>Cars as a factor in national prestige.</td>
<td>0.15</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.06</td>
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</tr>
<tr>
<td>Cars are useful for farmers.</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.05</td>
<td>0.11</td>
<td>0.05</td>
</tr>
<tr>
<td>Cars will replace horses.</td>
<td>0.10</td>
<td>0.07</td>
<td>0.00</td>
<td>0.00</td>
<td>0.06</td>
<td>0.05</td>
</tr>
<tr>
<td>Concern about horses frightened by cars.</td>
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<td>0.07</td>
<td>0.00</td>
<td>0.00</td>
<td>0.06</td>
<td>0.05</td>
</tr>
<tr>
<td>Cars portrayed as expensive luxuries.</td>
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<td>0.00</td>
<td>0.22</td>
<td>0.10</td>
<td>0.00</td>
<td>0.05</td>
</tr>
<tr>
<td>Visions of affordable cars.</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.04</td>
</tr>
<tr>
<td>Cars need safety improvements.</td>
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<td>0.14</td>
<td>0.00</td>
<td>0.00</td>
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<td>Racing, trials, or long-distance drives.</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.10</td>
<td>0.00</td>
<td>0.04</td>
</tr>
<tr>
<td>Support for strict penalties for reckless drivers.</td>
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<td>0.07</td>
<td>0.11</td>
<td>0.00</td>
<td>0.06</td>
<td>0.04</td>
</tr>
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<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.02</td>
</tr>
<tr>
<td>Cars will never replace horses.</td>
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<td>0.00</td>
<td>0.11</td>
<td>0.00</td>
<td>0.00</td>
<td>0.02</td>
</tr>
<tr>
<td>Technical discussions.</td>
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<td>0.00</td>
<td>0.11</td>
<td>0.00</td>
<td>0.00</td>
<td>0.02</td>
</tr>
<tr>
<td>Motorists have rights to the road.</td>
<td>0.00</td>
<td>0.00</td>
<td>0.22</td>
<td>0.00</td>
<td>0.00</td>
<td>0.02</td>
</tr>
<tr>
<td>Concern about amalgamated car companies.</td>
<td>0.00</td>
<td>0.00</td>
<td>0.11</td>
<td>0.00</td>
<td>0.00</td>
<td>0.01</td>
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</tbody>
</table>
The quantitative analysis also illustrates support for story-lines portraying cars as inherently progressive, which would have gained narrative fidelity from the contemporary enthusiasm for technological progress. The editorial in the founding issue of Motor World extolled the virtues of “progress, improvement, and development”, which it held were epitomized by the motor transport industry. The Boston Globe predicted the demise of the horse as early as 1898, and all the newspapers surveyed made similar predictions at one point or another (Table 5.2). Cars were sometimes seen as a harbinger of far more amazing technologies to come. In 1899 a Boston Globe editorial paraphrased Senator Depew’s comments at the Electrical Exposition of New York, in which Depew noted that he had

Walked from his house to Madison Sq Garden in 1893; in 1897 he came down in a Hansom cab; in 1898 he came on electric railroad, and this year he came down in an automobile. Who can say that next year he may not come down on wings moved by electricity, descending like an angel through the roof and alighting on the platform amid the cheers of the multitude?

The technological progression depicted in this story is quite striking, but so is the fact that Depew, a former president of several railways, was a central character. The fact that Depew was willing to speak so favourably of cars suggests that while he saw them as a novelty, he did not see them as a threat to his railway interests.

The story-line portraying cars as inherently progressive was particularly evident in 1899, during a minor controversy which ensued when cars were banned from parks in New York City and Chicago. The Chicago Tribune’s editorial response to this argued that such bans would “prove a hindering obstacle to our hitherto splendid municipal progress and will be a confession that Chicago is behind other great cities of the world”. A municipal judge quoted in the article apparently agreed, describing the rule as an example of “fogyism”.

The Baltimore Sun, interestingly taking time to comment on a purely local controversy in a faraway city, said that the authorities who had banned cars from Chicago parks had

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585 Elliott, E. S., 1899, Says rule is against law: Power of park board to ban automobiles, Chicago Daily Tribune, 17 June, p. 8.
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“planted [themselves] in the way of a movement that cannot be stopped any more than we can stop electric traction or do away with the bicycle.”\textsuperscript{586}

Suggestions that motor transport could challenge the railways primarily came from the motor press. In 1903, \textit{Motor} portrayed car makers as “genuine benefactors of America’s future,” and was one of the few publications from this period portraying cars as a challenger to the railways: “American mechanical genius is now concentrated upon the automobile as it had been upon the locomotive during the past generation.”\textsuperscript{587} In 1902, \textit{The Motor Age} agreed, arguing that: “From a logical standpoint there is no more sense in running a wagon over stones than there is in doing the same with a locomotive.”\textsuperscript{588} This implied that cars, being a transport system of comparable importance to the railways, should receive similar infrastructural support; a position that \textit{Motor} repeated in another editorial from that same year.\textsuperscript{589} \textit{Motor} was probably the most aggressive exponent of the view that cars could replace trains, publishing editorials mobilising popular outrage against the railways in support of cars, which would “render the suburbanite independent of the railroad monopoly”.\textsuperscript{590} For the most part, however, cars were not seen as a challenge to the railways: Nine percent of the articles from the quantitative analysis predicted that road transport would supplement the railways, rather than compete with them. Newspaper article positioned motorized transport as a better way for rural residents to access the railway network, or as a temporary fix which could open up remote territory in advance of a railway line, or as a new way to propel trains.\textsuperscript{591} It was, however, very rare outside the motor press to see road transport as directly competitive with the railways.

\begin{itemize}
  \item \textit{Baltimore Sun.}, 1899, ‘Taking the law to them’, 18 March, p. 10.
  \item \textit{The Motor Age}, 1902, ‘General Roy Stone on Steel Highways’, 13 March, 1 (11), p. 15.
  \item \textit{The Great National Question: Great National Roads}, 1(3), p. 16.
\end{itemize}
Negative Story-Lines

The dominant negative story-line about cars portrayed them as an impractical, dangerous, and annoying technology. This story-line rested on the limited empirical credibility of motor vehicles, as those proposing practical uses for them were often singled out for ridicule. When the Librarian of Congress asked for a car to use in the performance of his duties, several Congresspeople made fun of the proposal. Prominent populist Democrat William Jennings Bryan chose to conduct his 1900 presidential campaign by automobile, possibly as a way of expressing his opposition to the railways, which remained consistent throughout his political career. This was interpreted differently by an editorial cartoonist, however, who depicted Bryan tearing down a road and leaving chaos in his wake (Figure 5.7).

Figure 5.7: William Jennings Bryan's decision to use a car in his 1900 campaign made him the target of criticism.


The rearing horse, fleeing farm animals, and clouds of dust depicted in this cartoon demonstrate that, as in the United Kingdom, cars aroused considerable concerns about safety and public nuisance. Three of the top 10 story-lines listed in table 5.2 argue either that cars are dangerous or that they should be subjected to regulations to protect the

\[593\] Thomas 2007.
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public. One of these was a 1900 Boston Globe article, satirically reporting that “A man was seen running an automobile carefully and properly through the streets of Boston yesterday with due regard for the rights of other people. Such a sight is so unusual that other people turned to look at him”. \(^{594}\) A lengthier Globe editorial invoked American democratic rhetoric in the contention that “The right to life, liberty and the pursuit of happiness is just as sacred to the slow-moving sage and the cripple as to the pompous automobilist or power-inflated driver of a bicycle or trolley car”. \(^{595}\) Cars came under particularly consistent criticism in the New York Times, whose editor got involved in a public disagreement with the editor of Automobile, explaining in 1905 that the paper was opposed with much vehemence to not a few things that can be described-by stretching the language a bit-as ‘pertaining to automobiles’. It has been and is opposed, for instance, to the use of public highways as race courses...it has been and is the relentless enemy of every automobilist who wilfully violates the laws of the towns through which he rides.\(^{596}\)

The Times’ conservatism and carefully cultivated image as a voice of moderation may have predisposed it to being a critic of cars. Another editorial expressed concern with the fact that “railway speeds may be attained on ordinary roads”, and proposed the mandatory installation of governors, which would automatically limit the speed of all motor vehicles. \(^{597}\) This invocation of “railway speeds” as a reason to be concerned about the safety of automobiles was particularly common in the New York Times. In 1901, the editor worried that “The lowest of the [car speed] records far exceeded the extreme limit of safety, and served to demonstrate the practically useless fact that vehicles can be run on common roads at speeds not often, if ever, attained on roads”. \(^{598}\) Another article made the same comparison, and argued that such speeds were safe for trains because they could be run on dedicated track, but not for cars, which lacked this infrastructure. \(^{599}\) The Boston Globe observed in its “Editorial Points” that “Automobiles now sell for $200 that are warranted to go 70 miles an hour. But they are not insuring your neck yet.” \(^{600}\) At this point, the increasing top speeds of cars were viewed as a liability rather than an asset, as illustrated by the New York Times’ characterisation of high car speeds as “practically useless”. Cars on roads may not have faced a serious legitimacy struggle as they did in the United Kingdom, but due to the problem of accidents, cars going quickly on roads did.

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Defensive Story-Lines

In response to these negative story-lines, supporters of cars fell back on progressive story-lines. This was particularly evident in the *Washington Post*, which argued that opposition to cars was simply the result of a predictable knee-jerk aversion to progress. In 1902, the *Post* published an editorial arguing that “The automobile is simply going through a stage of development, in connection with public regard, that every new thing goes through if it possesses any side more dangerous than a sofa pillow...the reader need not be white haired who can look back to the time when his grandmother regarded the camphene lamp as the devil's invention”.\(^{601}\) In 1905, another *Post* article compared cars’ critics with those of the past century who “so violently opposed the steam locomotive that they tore up the rails. There are doubtless many members of this community, as well as others, who would prefer going back to the old stage-coach days.”\(^{602}\) Car magazines promoted similar story-lines about a progressive technology held back by unimaginative critics,\(^{603}\) with the editorial in the inaugural issue of *Motor* predicting that the cars’ opponents would one day “be ashamed of their former condition of antagonism against one of the blessings of the age.”\(^{604}\) This indicates a reliance on narrative fidelity, particularly as it related to the idea of technological progress, as a defensive story-line for the motor niche.

5.2.5. Conclusion

This period fits well both with the analytical model, particularly on the point that contestation between niche and regime actors is muted during this phase. The American railways, secure in their position as the dominant means of intercity transport, did not pay very much attention to the rise of road transport. Instead, they were engaged in their own struggles over amalgamation and their treatment of passengers and shippers. Positive story-lines portraying the railways as technological marvels, and defensive story-lines portraying railway regime actors as more knowledgeable than their uninformed mob of critics, had limited resonance, due to railway actors’ poor actor credibility and the prevailing scepticism of business trusts. Railway critics’ story-lines benefited from empirical credibility and experiential commensurability due to concerns about accidents and the quality of railway service. When this was combined with the narrative fidelity gained from anti-trust landscape discourses, it became resonant enough to influence policy agendas.

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Motor vehicles, meanwhile, were engaged in a struggle over empirical credibility, with their proponents promoting them as progressive and useful, while their detractors condemned them as impractical nuisances. The importance of story-lines about technical progress for the motor niche is instructive of the importance of narrative fidelity for niche-level story-lines during the first phase of a transition. This does not match perfectly with the analytical model, which predicts that niche actors use visions of the future to develop narrative fidelity. While American car supporters did not widely use such visions, however, they did position cars in terms of popular optimistic attitudes about the technological future. Supporters of the early American motor niche thus made appeals to the cultural landscape, as the analytical model predicts, even if they did not do so in exactly the way that the analytical model predicts.
5.3. **Period II: Stabilization (1910-1929)**

5.3.1. **Introduction**

After 1910, the American motor niche rapidly gained momentum, as cars became more popular and roads across the country were improved for use by cars. By the time the stock market crashed in 1929, motor vehicles were able to compete with the railways on their own terms, and indeed exceeded the railways in terms of passenger-miles travelled well before that date (Figure 5.8). While many of these passenger-miles were probably local, since road infrastructure and roadside amenities would not be well-suited to long-distance touring until the 1930s, the railway regime nevertheless faced destabilization due to a variety of causes. One of these was the burden of increasing regulation. In 1910, the Mann-Elkins Act imposed further restrictions on railway rates and gave the railways the burden of proof in rate disputes. In practice, this meant that the Interstate Commerce Commission did not allow sufficient rate increases to cover the railways' rising costs, and by the autumn of 1915, approximately one in six American railways was either under court control or awaiting receivership.

![Figure 5.8: Road and rail passenger transport in the United States, 1910-1929. Data from Cain, 2006.](image)

Labour disputes were another source of pressure. A strike in 1916 ended with Congress imposing an 8-hour work-day on the railways, despite this being very difficult to accommodate within fixed railway timetables. As in the United Kingdom, the railways were placed under government control during the First World War, and as in the United

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605 Flink 1988, p. 360.
606 Belasco 1979, p. 142.
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Kingdom, they were returned to the private sector badly damaged, with many railway critics seizing the opportunity to call for nationalisation on a permanent basis in order to protect workers, shippers, and travellers.610 These suggestions were not heeded, and in 1920 the railways were returned to their owners with a new regulatory provision that any profits over 6% would be recovered by the Federal government.611 This made long-term financial planning very difficult, and worsened the railways’ commercial problems during the 1920s. Growth in the railway sector began to falter around 1925.612

At the same time, motor transport was becoming increasingly integrated into American society. Between 1910 and 1920, institutions such as city and state governments, as well as the National Parks service, implemented policies to create more road space for motor vehicles.613 The Federal government got involved in 1916 with the passage of the Federal Aid Road Act, providing $75 million over 5 years to state highway departments to create a network of long-distance roads.614 While the railways had advocated that this money be allocated to farm-to-market roads, which would supplement the railways, it was instead allocated to intercity roads which allowed road transport to compete directly with them.615 In 1921, the Federal Highway Act provided federal funding for a national network of interstate roads.616 This made it possible to comfortably drive hundreds of miles in a day, and encouraged the growth of cars and buses as a serious mode of interstate transport.617

As they began to notice the threat posed by motor transport, railway actors promoted a story-line portraying rail transport as inherently more efficient than road transport, and another one that portrayed the railway regulatory regime as unfair and outdated. Negative story-lines, meanwhile, continued to condemn the railways and their supporters as abusive monopolists. Positive story-lines about motor transport argued for the adaptation of the nation’s infrastructure to motor traffic, using new roads and new traffic laws. This was supported by story-lines which portraying modern roads as an essential development for the twentieth century. The increasing accident rate, however, led to negative story-lines portraying cars as dangerous.

610 Kerr 1968, p.68.
614 Barron 1992, p. 94.
615 Barron 1992, p. 95.
617 Belasco 1979, p. 132.
5.3.2. The Cultural Landscape

By 1910, the populist distrust of business trusts had morphed into progressivism, a political philosophy which rejected nineteenth-century laissez-faire liberalism in favour of a rationalized, expert-driven, and socially-responsible economy and society.618 This remained an important political and cultural force in the United States until approximately the end of the First World War,619 and was increasingly connected during this period to the ideology of scientific management, in which the language of science and engineering was adapted to social problems by actors promising a more efficient society.620 According to historian Ralph Gabriel, “The word ‘scientific’ became one of the most potent adjectives in the American language”.621 Although the “machine age” had cultural critics who worried about the effect of technology on human relations,622 this enthusiasm for technocracy and technology made large-scale centrally-managed reforms of business practices, infrastructures, and public space comparatively easy. Progressivism still contained a distrust of the railways, but this enthusiasm led to support for the construction of new roads.

By the end of the First World War, this attitude was replaced by a new approach to public affairs, known as “associationism”, which favoured interactions and negotiations between unabashedly self-serving interest groups. This view was promoted by Secretary of Commerce and future President Herbert Hoover, who applied it particularly to questions of urban transport,623 giving an increasingly prominent motor lobby an ideal opportunity to argue for societal changes that would help them further embed cars into American life. Another cultural development during the 1920s was a growing ideology of mass leisure:624 President Calvin Coolidge in particular was known for promoting outdoor recreation as a way of consolidating and unifying American society. Cars were thus easily positioned as an ideal way for travellers to take advantage of the 1920s’ increasing prosperity and enjoy the outdoors.

618 Tallack 1991, p. 147
621 Gabriel 1974, p. 75.
622 Popp 2011, p. 459.
624 Belasco 1979, p. 77.
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5.3.3. The Railways’ Regulatory Struggle

Positive Story-Lines

Two closely-related story-lines supported the railways during this period. One of these was optimistic, arguing that the railways were both more essential and more efficient than motor transport, and that they would therefore ultimately prevail as the dominant means of transport. A second, far more common story-line, however, was less optimistic: It bitterly complained about the regulations to which the railways were subjected. This complaint appeared in 13 percent of newspaper editorials about the railways during the 1910s, and 10 percent of all editorials during the 1920s (Table 5.3, Table 5.4).

The story-line emphasizing the railways’ efficiency was most common in the railway journals. During the 1910s, the *Electric Railway Journal* was such an aggressive promoter of this view that it described the motor vehicle industry as fundamentally useless and wasteful, on the grounds that “the automobile offers the one great advantage of convenience, but to offset this the interurban offers speed and cheapness,” and that cars were therefore a frivolous purchase.\(^{625}\) *Railway Age* took road competition more seriously and saw a role for motor freight haulage in distributing food, but still argued that the railways were superior for most other applications.\(^{626}\) Even after the end of the First World War, *Railway Age* continued to hold that “the only condition under which busses on the highways have a decided advantage is where the railroads are located some distance from the centres of population along the route.”\(^{627}\) These views softened after the First World War. By the middle of the 1920s, the *Electric Railway Journal* had begun calling for better integration of bus networks with the electric railways,\(^{628}\) though it continued to argue that the best transport system involved coordination between road and rail. This fit well with the railways’ political programme, which advocated the construction of farm-to-market roads,\(^{629}\) rather than intercity highways. Support for this proposal was rare outside of the railway journals and a handful of small farmers’ groups, however,\(^{630}\) with virtually no mention of farm-to-market roads in any newspaper surveyed from 1916, when Congress was debating different proposals for road funding. The contention that railways were

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626 *Railway Age*, 1918, ‘Chamber of Commerce of U.S. Sounds Warning’. 64(15), pp. 1011-1019.
628 *Electric Railway Journal*, 1925, ‘Electric Railways are Forging Ahead’, 65 (1), pp. 1-2;
629 Barron 1992, p. 95.
630 Barron 1992, p. 95.
better-suited to intercity transport, and the vision of a coordinated transport system that went with it, thus had virtually no support outside of fora such as the *Electric Railway Journal*. It is therefore unsurprising that the railways failed to get any major support for their proposal for farm-to-market roads, and eventually abandoned it.

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<td>0.00</td>
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<td>0.05</td>
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<td>0.00</td>
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<td>Service complaints.</td>
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<td>Railway companies are incompetent.</td>
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<td>0.00</td>
<td>0.00</td>
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<td>Analysis of railway policy or regulation.</td>
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<td>0.00</td>
<td>0.10</td>
<td>0.10</td>
<td>0.02</td>
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Table 5.3: The results of a quantitative content analysis of newspaper opinion articles about railways from 1910 to 1919.
The evolution of discursive story-lines during socio-technical transitions

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<td>0.40</td>
<td>0.20</td>
<td>0.40</td>
<td>0.15</td>
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<td>The railways are over-regulated</td>
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<td>0.30</td>
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<td>0.05</td>
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<td>There is hope for a railway resurgence.</td>
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</tr>
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<td>0.00</td>
<td>0.05</td>
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<td>0.15</td>
<td>0.00</td>
<td>0.00</td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td>Praise of railway innovation or development.</td>
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<td>0.10</td>
<td>0.05</td>
<td>0.00</td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td>Opposition to nationalised railways.</td>
<td>0.00</td>
<td>0.00</td>
<td>0.20</td>
<td>0.00</td>
<td>0.00</td>
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</tr>
<tr>
<td>Defence of the railways.</td>
<td>0.00</td>
<td>0.10</td>
<td>0.05</td>
<td>0.00</td>
<td>0.00</td>
<td>0.03</td>
</tr>
<tr>
<td>Critical discussion of railway amalgamations.</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.15</td>
<td>0.00</td>
<td>0.03</td>
</tr>
<tr>
<td>The railways are negligent on safety.</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.15</td>
<td>0.03</td>
</tr>
<tr>
<td>Technical discussions.</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.15</td>
<td>0.00</td>
<td>0.03</td>
</tr>
<tr>
<td>Critics of the railways are socialists.</td>
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<td>0.00</td>
<td>0.10</td>
<td>0.00</td>
<td>0.00</td>
<td>0.02</td>
</tr>
<tr>
<td>Railway speed records.</td>
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<td>0.00</td>
<td>0.10</td>
<td>0.00</td>
<td>0.00</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Table 5.4: The results of a quantitative content analysis of newspaper opinion articles about railways between 1920 and 1929.

If the railways were in fact inherently more efficient than the roads, then the railway journals had to somehow account for why they were losing the commercial battle against them. For this, they typically pointed to unfair regulations and a poorly-informed public. The editor of *Railway Age* complained that “The preponderance of the propaganda against the railways over that being carried on in their defence is so great that it is becoming a serious menace to all fair and reasonable regulation,”631 and called on railways to do a better job of public relations. The *Electric Railway Journal* made similar complaints about the effect of a hostile public and political establishment on the prospects for effective coordination.

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between road and rail. Complaints about unfair railway regulations were also common in mainstream newspapers (Figure 5.9), where they were the second most common theme in opinion journalism about the railways in both the 1910s and 1920s (Table 5.4). Newspaper coverage of the Mann-Elkins Act frequently reproduced the railway journals’ story-line, condemning Congress for trying to regulate a technological system they knew little about. The New York Times, which still had a conservative, pro-business attitude during this period, reassured the Interstate Commerce Commission that “public opinion has undergone a change in regard to the railroads...the grant of living rates to the railroads will no longer be a subject of complaint or resistance.” This view appeared in many other newspaper editorials and letters to the editor. This view also sometimes appeared in Congress, such as when prominent New York Republican Senator Elihu Root complained that “Railroads can't help but violate the law while doing 'the business of the country'—they should be able to enter into fare agreements, subject to agreements being made public and approved by the ICC”.

As the railways emerged badly damaged from the First World War, story-lines portraying them as victims of an incompetent government bureaucracy persisted. Complaints about the over-zealous regulations remained common in newspaper articles about the railways (Table 5.4), and several editorial cartoons depicted an inept Uncle Sam trying to return the badly damaged railways to their dismayed owners (Figure 5.10). The phrase “help the railroads” appears frequently in newspaper articles and letters to the editor of this period, as journalists and correspondents pointed to the twin problems of burdensome regulation and unfair public condemnation.

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634 Schudson 1978, p. 110.


The evolution of discursive story-lines during socio-technical transitions

its city’s access to Eastern markets and not yet confident in the ability of the roads to fill in the gap left by the railways, accused Congress of being “more concerned about the prospective earnings of the roads than the kind of service they will give.”\(^{(641)}\) The New York Times, also describing the railways as an essential national service, argued that “Whatever the railways’ profit, or its distribution among the railways, the profit of the country will be larger than by bankrupting the railways.”\(^{(642)}\) The Los Angeles Times warned that if the railway network collapsed, “Unless an ocean service can be established through the Panama Canal there will be slack production and an increase in prices that a shortage of supply always entails.”\(^{(643)}\) This story-line may still have had appeal in geographically isolated cities such as Los Angeles, and in pro-business publications such as the New York Times, but it was fragile. As the roads became a more and more viable means of transport, story-lines positioning the railways as an economic linchpin became less and less tenable.

Figure 5.10: A cartoon observing the state of the railroads as they were returned to the private sector in 1920.

*The evolution of discursive story-lines during socio-technical transitions*

**Negative Story-Lines**

Negative story-lines about the railways during this period persisted from the previous one, emphasizing everyday frustrations and problems of the railways, including poor service, high costs, and bad safety records. Critics blamed these problems on the railways’ exploitative and monopolistic managers. Growing concerns about over-regulation made this less prominent in the opinion journalism about the railways (Table 5.3, Table 5.4), but these story-lines, remained disproportionately popular in Congress. In the debate over the Mann-Elkins Act, Idaho Republican Senator Weldon B Heyburn painted a dystopian picture of what the railways could do if their regulations were relaxed:

> the railroads are going to get the benefit of [the Panama Canal], because they are going to strangle the water traffic, and they are going to control the rates to the seaboard, at the expense of the country that lies between the terminals... That is the reason we are compelled to pay such exorbitant rates, in order that they may haul goods to the terminal points at a loss, perhaps.\(^{644}\)

Kansas Senator Joseph L. Bristow complained about how the railways “destroy the business of an individual, the result of a lifetime of labour, or may wreck the prosperity of a community, thereby destroying the fortunes of thousands of men”.\(^{645}\) Not all of these legislators were prominent figures, but their concerns were echoed by progressive President Woodrow Wilson in 1914, who said in his second annual message that “We lavishly subsidized the building of transcontinental railroads. We look back upon that with regret now, because the subsidies led to many scandals of which we are ashamed.”\(^{646}\) Wilson went on to propose, as Roosevelt had, a national network of waterways to provide an alternative to the railways.

Similar sentiments were voiced in the debates over returning the railways to private control after the First World War. Thetus W. Sims of Tennessee, one of the principal supporters of nationalization, argued that Wall Street used: “its power to finance in such a way as to exploit the roads to the detriment of the stockholders and the community at large”.\(^{647}\) Many congress-people feared that amalgamated railways would use predatory pricing tactics to eliminate the waterways, in order to dominate the interior transport market.

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\(^{644}\) *Annals of Congress*, 61\(^{st}\) Cong., 1\(^{st}\) sess., 4268.

\(^{645}\) *Annals of Congress*, 67\(^{th}\) Cong., 1\(^{st}\) sess., 5484.


\(^{647}\) *Annals of Congress*, 62\(^{th}\) Cong., 2\(^{nd}\) sess., 8327.
Representative Jared Sanders, a former governor of Louisiana,\textsuperscript{648} predicted that if the bill was passed, “the dream of the utilization of our waterways will never come about. Pass this bill and you have placed water transportation at the mercy of an enemy that has never known mercy.”\textsuperscript{649} The general sentiment was that the railways were not to be trusted, and that they would use predatory pricing tactics to eliminate competing modes of transport if given a chance, did not bode well for their chances of eliminating their regulatory disadvantage compared with road transport, as will be shown in section 5.4.3.\textsuperscript{650}

While the story-line about monopolistic railway managers does appear in some in letters to the editor,\textsuperscript{651} such as one published in the \textit{Chicago Tribune} calling on the paper, “to devote some space and efforts to the interests of the public…I refer first to the inexcusable, unjust, and infamous interstate passenger rate,”\textsuperscript{652} it became far less common in newspapers, with concerns about amalgamations only appearing in the \textit{New York Times} during the 1920s. Story-lines associating the railways with the threat of monopoly were losing empirical credibility, as knowledgeable newspaper columnists began to recognize the meaningful competition provided by the roads. They retained some experiential commensurability, however, from a public that was not eager to forgive the railways’ past transgressions. This might explain the ongoing political appeal of negative story-lines about the railways, and might also suggest an important liability for regime story-lines: Bad experiences, whether real, imagined, or remembered, have a very immediate resonance with ordinary members of the public, while empirical facts may require expertise, or at least effort, to understand. This might in some cases give an important advantage to story-lines that benefit from a high degree of experiential commensurability, even if the experiences that they refer to occurred in the past.

During the late 1920s, the view that the railways were economically indispensable began to collapse in the face of an increasingly viable road regime. As newspaper commentators began to notice this, they positioned the roads for the first time as a serious challenger to the railways. In 1926, the editor of \textit{The Washington Post} observed that “quietly, fighting stiff competition at all times, the bus has forged ahead. The industry has passed the experimental stage, and seems to be standing on its own feet”, to compete with the

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{648}Biographical Dictionary of the United States Congress, 2015b.
\item \textsuperscript{649}\textit{Annals of Congress}, 66th Cong., 2nd sess., 8337.
\item \textsuperscript{650}\textit{Annals of Congress}, 66th Cong., 2nd sess., 8376; 8591; 8592; 8603; 8337.
\end{itemize}
\end{footnotesize}
The evolution of discursive story-lines during socio-technical transitions

railways. The New York Times and the Boston Globe agreed, with the editor of the New York Times arguing in 1926 that the idea of motor transport fitting into the railway system was “a rather Western than an Eastern view. In this neighbourhood some railways have cut down their service because of loss of traffic.” The editor of The Washington Post observed that “Motor bus lines all over the country have become such strong competitors of steam railways as to require the attention and consideration of the Interstate Commerce Commission. The fact that these newspapers were all based in the East, where populations were more dense, distances were smaller, and roads developed faster, might suggest that roads began competing with railways in some places sooner than others. Nevertheless, as the story-line portraying the railways as essential lost empirical credibility in the face of an increasingly confident road regime, motor transport began to look less like an incremental improvement to the railways, and more like a wholesale challenge to them.

5.3.4. Building the American Road Regime

Positive Story-Lines

Some of the same positive story-lines from the previous period persisted into this one. The association of cars with progress, in particular, remained widespread during the 1910s (Table 5.5). As the empirical credibility of cars improved, however, such appeals to narrative fidelity became just one of a number of discursive strategies on which supporters of road transport could draw. New story-lines increasingly emphasized the practical value of motor vehicles, particularly their utility for farmers. Advertisements abandoned their focus on the technology itself, and began to depict cars as objects of class and sophistication, or as ways to reach the American wilderness (Figure 5.11). An increasingly prominent positive story-line during this period supported roads rather than vehicles. Calls for investment in new roads were the seventh most common theme in the quantitative analysis of opinion journalism from the 1910s, and by the 1920s they were the most popular (Table 5.5, Table 5.6). A positive story-line about roads portrayed them as an exciting development which would civilize and democratise the country, while also bringing social benefits, such as safety and national efficiency.

This is evident in the increasing popularity of the Good Roads Movement, which had begun as a movement of cyclists agitating for good roads from the end of the nineteenth century, but received much more media attention during the 1910s, as a movement of motorists advocating improved roads for driving (Figure 5.13). The good roads vision imagined not just local roads that would be useful to farmers and other rural dwellers, but also a nationwide network of good-quality intercity highways suitable for long-distance motor touring (Figure 5.12). Newspaper coverage of the Good Roads movement, and of new roads more generally, was largely positive, and at times even explicitly anti-railway. As early as 1911, the *Washington Post* was arguing explicitly for a nationwide road network, noting that: “All of the States named have many miles of excellent highways of their own, but the connecting links between the States is missing.” In 1917, the *Baltimore Sun*’s motoring correspondent praised Maryland’s roads as a point of state pride. In 1920, the

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658 Holley 2003, p. 716
Los Angeles Times advocated good roads as a way of empowering trucks, which it argued were naturally superior to the railways.\textsuperscript{661}

\begin{table}[h]
\centering
\begin{tabular}{|l|c|c|c|c|c|c|}
\hline
 & \textit{Boston Globe} & \textit{Chicago Tribune} & \textit{Los Angeles Times} & \textit{New York Times} & \textit{Washington Post} & All Newspapers \\
(19) & (14) & (18) & (20) & (20) & (91) \\
\hline
Accidents and safety concerns. & 0.11 & 0.36 & 0.17 & 0.55 & 0.05 & 0.24 \\
Reckless drivers. & 0.00 & 0.14 & 0.11 & 0.40 & 0.05 & 0.14 \\
Cars are progressive. & 0.16 & 0.00 & 0.11 & 0.05 & 0.15 & 0.10 \\
Cars contribute to the economy. & 0.21 & 0.07 & 0.06 & 0.05 & 0.05 & 0.09 \\
Cars are a necessity & 0.05 & 0.00 & 0.11 & 0.10 & 0.10 & 0.08 \\
Cars are useful for farmers. & 0.26 & 0.00 & 0.11 & 0.00 & 0.00 & 0.08 \\
Support for good roads. & 0.11 & 0.00 & 0.17 & 0.10 & 0.00 & 0.08 \\
Discussion of the American car industry. & 0.05 & 0.00 & 0.28 & 0.00 & 0.05 & 0.08 \\
Support for strict penalties for reckless drivers. & 0.00 & 0.00 & 0.11 & 0.25 & 0.00 & 0.08 \\
Motor touring or recreation. & 0.11 & 0.00 & 0.11 & 0.00 & 0.10 & 0.07 \\
Cars are displacing horses. & 0.11 & 0.07 & 0.17 & 0.00 & 0.00 & 0.07 \\
Cars are a threat to pedestrians. & 0.05 & 0.14 & 0.00 & 0.10 & 0.00 & 0.05 \\
New uses for cars. & 0.00 & 0.00 & 0.00 & 0.00 & 0.25 & 0.05 \\
Cars are becoming affordable. & 0.11 & 0.00 & 0.06 & 0.05 & 0.00 & 0.04 \\
Seeing the country by road. & 0.05 & 0.07 & 0.11 & 0.00 & 0.00 & 0.04 \\
Motor highways. & 0.11 & 0.00 & 0.00 & 0.00 & 0.00 & 0.02 \\
Cars are a nuisance. & 0.00 & 0.14 & 0.00 & 0.00 & 0.00 & 0.02 \\
Cars are holding the railways accountable. & 0.00 & 0.00 & 0.11 & 0.00 & 0.00 & 0.02 \\
Advice for drivers. & 0.00 & 0.00 & 0.00 & 0.00 & 0.10 & 0.02 \\
\hline
\end{tabular}
\caption{The results of a quantitative content analysis of newspaper editorial coverage road transport between 1910 and 1919.}
\end{table}

\textsuperscript{661} Los Angeles Times, 1920, 'Trucks and Traffic', 26 August, 14.
The Lincoln Highway association, founded in 1913 with the goal of promoting a transcontinental highway across the United States, provides a good example of the kinds of story-lines that were used by the most dedicated supporters of long-distance paved roads. Supporters of the Lincoln Highway often described it as an object of state or national prestige. One letter to the *Baltimore Sun*, for example, described the road as a fitting memorial to Abraham Lincoln, who, it argued, had been too pragmatic to be immortalized with a statue. Cities and towns competed to have the road built near

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662 Flink 1988, p. 170; Paxson 1946, p. 241
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them, and the General Federation of Women’s Clubs volunteered to plant flowers along the entire route. Another correspondent in the Sun supported the road on the grounds that it would allow the postal service to use motor vehicles and therefore avoid the railways’ extortions. The proposed road was almost never portrayed negatively, with the most sceptical articles simply disagreeing about the cost of the road, as was the case in a 1913 New York Times editorial.

The Congressional debates over the 1916 Federal Aid Road Act provide another illustration of the kinds of story-lines that were used to justify new roads. The 1916 Act was rarely discussed in terms of its implications for drivers, but instead Congresspeople emphasized its value for the economy, especially for farmers. Virginia Representative Edward W. Saunders’ dramatic speech in support of the bill argued that

[Rural people] bear the burden of the Government in times of peace, and in times of war the country boy and the boy from the smaller town fearlessly follow the flag where ‘thickest falls the red rain of human slaughter’ He receives little of the blessings of government beyond the post office and the rural carrier, but in times of need he forgets all this and gives himself freely, if need be, in the cause of his country. This bill is for him.

Others made similar appeals to rural benefits. Many of these were Southern or Western Democrats appealing to the agrarian streak that was common in that wing of the party. Others in congress promoted the value of good roads for national defence. Even the bill’s opponents did not question the principle of building good roads, drawing instead on the political discourse of states’ rights, challenging the financial and constitutional implications of the new, federally-managed roads.

Several presidents during this period also supported the principle of good roads. In 1918, President Woodrow Wilson addressed Good Roads in his annual message. In 1923, Calvin Coolidge positioned cars as a central part of the nation’s economy, arguing that “No
expenditure of public money contributes so much to the national wealth as for building good roads.\textsuperscript{674} Warren G. Harding was more comfortable with the idea of roads replacing the railways, arguing in Congress that “The highways are not only feeders for the railroads and afford relief from their local burden, they are actually lines in commerce…and the motor car has become an indispensable instrument in our political, social, and industrial life.\textsuperscript{675}

Support for farmers continued to play an important role in the debates over the 1921 Federal Highway Act,	extsuperscript{676} but by now roads were also routinely described as an alternative to the abusive railways. Michigan Representative Roy O. Woodruff argued that “It is a fact that intercity and interstate motor-truck transportation of merchandise is growing larger and larger each year, hastened, of course, by the exorbitant freight rates charged by the railroads”.\textsuperscript{677} While Woodruff was not a prominent senator and this story-line was marginal in the justifications for the Highway Act, it does illustrate that the view that it would be a good thing for the railways to suffer from road competition was present in Congress. This view would become more important in future debates, particularly during the next period, when the railways started asking for a regulatory reprieve. Given the fact that the Federal Highway Act supported interstate roads rather than just farm to market roads, it is also plausible that the frequent invocation of farmers as its key beneficiaries contained the subtext that part of this benefit would be freedom from exploitation by railway magnates.

**Negative Story-Lines**

Negative story-lines during this period emphasized the problems that arose from an increasingly popular motor transport niche, portraying cars and their reckless drivers as a menace, particularly to urban residents. Accidents and safety concerns were the most popular theme in opinion journalism about cars and roads during the 1910s, and several articles were found in the content analysis described cars as inherently dangerous (Table 5.5).


\textsuperscript{675} Annals of Congress, 67\textsuperscript{th} Cong., 1\textsuperscript{st} sess., 3086.

\textsuperscript{676} Ibid; Annals of Congress, 67\textsuperscript{th} Cong., 1\textsuperscript{st} sess., 5104; Annals of Congress, 67\textsuperscript{th} Cong., 1\textsuperscript{st} sess., 7128.

\textsuperscript{677} Annals of Congress, 67\textsuperscript{th} Cong., 1\textsuperscript{st} sess., 3093.
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In response to the growing toll of accidents, urban pedestrians launched safety campaigns, emphasizing notions of natural justice and calling attention to the grief and loss of accident victims (Figure 5.14).

Figure 5.14: The second-prize entry from a safety poster contest put on by the *Milwaukee Journal*. From Norton 2008, p. 41.
<table>
<thead>
<tr>
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<tr>
<td>Motor vehicles necessitate new roads.</td>
<td>0.00</td>
<td>0.60</td>
<td>0.32</td>
<td>0.30</td>
<td>0.00</td>
<td>0.25</td>
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<td>Accidents and safety concerns.</td>
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<td>0.05</td>
<td>0.10</td>
<td>0.37</td>
<td>0.15</td>
</tr>
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<td>Aesthetics of roads.</td>
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<td>0.15</td>
<td>0.05</td>
<td>0.10</td>
<td>0.05</td>
<td>0.07</td>
</tr>
<tr>
<td>Motor transport is threatening the railways.</td>
<td>0.11</td>
<td>0.00</td>
<td>0.00</td>
<td>0.10</td>
<td>0.11</td>
<td>0.06</td>
</tr>
<tr>
<td>Support for motor vehicle regulations and taxes.</td>
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<td>0.05</td>
<td>0.00</td>
<td>0.16</td>
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<tr>
<td>Support for strict penalties for reckless drivers.</td>
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<td>0.00</td>
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<td>0.05</td>
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<td>“Carnage on the roads.”</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.05</td>
<td>0.05</td>
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</tr>
<tr>
<td>Discussion of road congestion.</td>
<td>0.00</td>
<td>0.15</td>
<td>0.00</td>
<td>0.10</td>
<td>0.00</td>
<td>0.05</td>
</tr>
<tr>
<td>Motor buses are becoming important.</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.10</td>
<td>0.05</td>
<td>0.04</td>
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<td>Incompetent drivers.</td>
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<td>0.10</td>
<td>0.00</td>
<td>0.05</td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td>Road transport has an unfair regulatory advantage over the railways.</td>
<td>0.05</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.11</td>
<td>0.03</td>
</tr>
<tr>
<td>Motor transport has become essential.</td>
<td>0.05</td>
<td>0.00</td>
<td>0.00</td>
<td>0.10</td>
<td>0.00</td>
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<td>Travel advice.</td>
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<td>0.00</td>
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</tr>
<tr>
<td>Complaints about car taxes.</td>
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<td>0.00</td>
<td>0.11</td>
<td>0.00</td>
<td>0.00</td>
<td>0.03</td>
</tr>
<tr>
<td>Existing roads are antiquated or shameful.</td>
<td>0.00</td>
<td>0.05</td>
<td>0.11</td>
<td>0.00</td>
<td>0.00</td>
<td>0.03</td>
</tr>
<tr>
<td>Concern about drunk driving.</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Table 5.6: The results of a quantitative content analysis of opinion articles about road transport between 1920 and 1929.

Criticism of the safety implications of widespread car use was expressed in dramatic terms quite similar to those seen in British newspapers during the 1920s. An editorial in the *Los Angeles Times* argued that the car could become “a death-dealing machine more sinister than the mighty instruments of war.”678 A letter to the editor of the *Chicago Tribune* compared the automobile to a pedestrian behaving in the following absurd and dangerous manner:

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walk through the loop on a busy day, holding your arms outstretched, making yourself as wide as a motor car. Wearing on your chest a mild kind of bomb, so that anybody you may happen to collide with will be injured about as much as if he had been struck by a motor car. Be sure to carry around in your pocket an automobile horn, and to sound it loud and long whenever there is a reluctance to let you through.679

Other newspapers echoed this view, with the sensationalist Boston Globe describing widespread carnage on the nation’s roads.680 Support for strict regulation of motorists, including measures such as mandatory speed governors on all cars, or mandatory total abstinence from alcohol for all drivers, remained common in the quantitative analysis of this period (Table 5.5, Table 5.6).681 Angry city-dwellers staged dramatic public displays and created macabre posters depicting the innocent victims of motor accidents (Figure 5.14). Urban “safety weeks” featured potent symbolism such as parades of children representing the dead, and giant monuments to traffic accident victims.682 This story-line was occasionally adopted by supporters of the railways and their proposed farm-to-market roads. In Congress, John M. Robson, asked rhetorically, “Do we want to destroy the ‘producers-to-consumers-system, and install a ’joy-rider’ system?683

Defensive Story-Lines

As in the United Kingdom, car advocates responded to this negative story-line by shifting the blame from the cars to the roads and the pedestrians. Motor interests groups employed narratives of freedom, asserting their inherent rights to use the roads as they pleased,684 and promoted a new engineering doctrine of “floor space”, which emphasized building more space to accommodate cars.685 They also used concerns about safety to argue for changes in traffic laws and traditions of the road. The most dramatic example of this was their creation of the word “jaywalker” to refer to pedestrians who walked in the roadway, a practice which had been perfectly acceptable until that decade. “Jaywalker” is a play on the word “jay”, which at the time referred to a clueless and backwards country person,686 so this term represents a particularly creative use of progressive story-lines about motor vehicles. Attempts by pedestrian organisations to combat this with their own invention of

“jay driver” failed because such a term lacked the same narrative fidelity, as argued by historian Peter Norton: “Critics of motorists could call them cold-hearted, tyrannical, or selfish, but a motorcar’s power, modernity, and worldly sophistication made its owner anything but a jay.” According to Norton, these tactics were largely successful by 1930:

In 1920, when Bussie Buckley asked whether streets were 'for commercial and pleasure traffic alone', the question was rhetorical. Of course they were not only for motor vehicles...In the motor age, Buckley's question became absurd and its answer (a more or less emphatic Yes) obvious to any child. The street is a motor thoroughfare.

From this point on, support for cars and roads snowballed, and by 1924, soon-to-be President Herbert Hoover was arguing that “the automobile is no longer a luxury—it is a complete necessity.”

5.3.5. Conclusion

Each of the railways’ positive story-lines during this period had a different weakness. The first story-line, which argued that the railways were unfairly regulated, caught on in the newspapers and may have gained some empirical credibility from regulatory blunders. It suffered, however, from a deficit of actor credibility due to a widespread mistrust of railway actors. As a result, Congresspeople continually condemned the railways as abusive monopolies. This suggests that even somewhat marginal story-lines can have an important impact on transitions if they are subscribed to by influential people. The second story-line, which portrayed the railways as highly efficient and economically essential system, fits well with the analytical model’s suggestion that incumbent regime actors during the stabilization phase will emphasize the advantages they still hold over the niche innovation in order to build empirical credibility. In this case, however, these advantages rapidly eroded as an expanded highway network made the roads increasingly viable as a replacement for the railways.

Story-lines supporting motor transport were much more successful. The view of cars as progressive, as well as the desire to free farmers from the abuses of the railways, made a powerful case for road construction. This framing of roads as a way of freeing people from the problems with the railway regime fits well with phase 2 of the analytical model, which predicts that niche actors will emphasize problems with the incumbent regime in order to motivate for accommodation measures. As in the British case, however, road advocates used a much wider variety of story-lines to advocate for new roads and traffic laws. In

687 Norton 2008, p. 78.
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particularly, they used the problems of car accidents to support changes in road infrastructure and traffic laws that would favour the expansion of the motor niche. This lends further support to the view that niche actors can position their innovation as a solution to a wide range of social problems, including those caused by the niche technology itself.
5.4. Period III: Contestation and Overthrow (1929-1945)

5.4.1. Introduction

Except for a short period following the 1929 stock market crash, the number of cars in the United States increased rapidly during the 1930s (Figure 5.15). Cars remained an economical means of leisure for families during the Depression,\(^690\) but despite the introduction of fast and luxurious new trains known as streamliners,\(^691\) the distance travelled on the railways declined due to both motor competition and the impacts of the depression (Figure 5.16). Railway passenger receipts declined by more than 50 percent during the early 1930s.\(^692\) The rationing of tyres and petrol during the Second World War gave the railways some short-lived relief, but this only delayed what was by that point inevitable: By the end of the Second World War, the roads had decisively replaced the railways as the dominant mode of American passenger transport.

This process was accelerated by changes to the national transport infrastructure. The railways responded to their financial struggles by scaling back their network (Figure 5.17). In contrast, the American road network was considerably expanded during this period, as

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\(^{690}\) Belasco 1979, p. 142.

\(^{691}\) Stover 1961, p. 235.

\(^{692}\) Belasco 1979, p. 142.
The evolution of discursive story-lines during socio-technical transitions

New Deal employment programmes invested lavishly in infrastructure, much of which included new roads (Figure 5.18, Figure 5.19). State governments also got involved: Louisiana populist governor Huey Long spent more than two thirds of his state budget on road construction during the 1930s. By the end of the decade, the United States’ first freeways were already under construction.

Figure 5.17: American railroad mileage, 1919-1945. Data from Cain, 2006.

Figure 5.18: American road mileage, 1929-1945. Data from Cain, 2006.

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693 Tindall and Shi 2000, p. 954-959.
694 Patton 1986, p. 53.
Policy decisions were much less supportive of the railways, which continued to struggle under Interstate Commerce regulations that did not apply to road transport. In an attempt to address this inequality, railway companies tried to persuade the Interstate Commerce Commission to regulate buses and trucks in the same way that it regulated the railways. The Commission had begun to study this proposal as early as 1926, but it took them until 1930 to produce the Parker Bill, which was promptly voted down in Congress. Regulation would not come to the road transport sector until 1935, and even then the regulatory framework had many exemptions: intrastate road transport was governed by a patchwork of often lenient state regulations, while many forms of commercial road traffic were exempted from the rules. The roads thus continued to enjoy both a regulatory and infrastructural advantage over the railways.

The struggle over infrastructure and regulation that occurred during this period was very one-sided. Road investment programmes faced virtually no opposition, buoyed by story-lines portraying them as both modern marvels, and as much-needed employment relief. While story-lines about burdensome regulations continued to support the railways, however, their proposals for regulatory reform encountered stiff resistance in Congress, partly due to story-lines which continued to portray railway companies as abusive monopolists.

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696 Stover 1961, p. 213.
5.4.2. The Cultural Landscape

The most immediate cultural impact of the Great Depression was widespread cynicism. Less than a year before the Wall Street Crash, President Herbert Hoover had been elected on a platform which promised the indefinite continuation of the prosperity that the country had known during the 1920s. As the economy faltered during the early 1930s, Americans began to question “a society where millions of people went hungry, ill clothed, and ill housed in the midst of plenty,” and directed their frustrations at a business and political elite that they believed had failed them. In 1932, the frustrated and exhausted American public brought down Herbert Hoover's government in a landslide, putting Franklin Delano Roosevelt into power on a platform of aggressive government intervention in the economy. This, as well as the necessities of the Second World War, led to a growing acceptance of government spending, and made major government spending on road infrastructure politically palatable.

Another cultural impact of the Depression was receptivity to radical visions of the future. This was the consequence of a turn to fantasy as a way of escaping the grim reality of the depression. It also resulted from an enthusiasm for technocracy due to the apparent failure of politicians and businessmen in running the economy; and a popular fondness for technological determinism. This made utopian visions of future road networks highly attractive.

5.4.3. The Railways’ Last Stand

Positive Story-Lines

Positive and negative story-lines about railways during this period both addressed the question of why the railways were in such a state of crisis (Figure 5.20). A supportive story-line, appearing in 8 percent of the articles surveyed for the quantitative analysis, blamed the crisis on meddling, incompetent government bureaucrats who were harming the railways’ ability to support themselves (Table 5.7). A more marginal positive story-line called attention to technological innovations on the railways, most notably that of streamliner trains.

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700 Tindall and Shi 2000 p. 951.
702 Dimmendberg 1995, p. 117.
Praises of railway innovations were only moderately popular during this period, showing up in just 5 percent of the articles surveyed for the quantitative analysis. However, the streamliners; new diesel-powered passenger trains with luxurious appointments and record-breaking schedules, inevitably attracted some newspaper attention, much of which was positive.\textsuperscript{703} The new trains appear in many cases to have been consciously designed to attract media attention. The first streamliner, for example, was the Burlington Railroad’s \textit{Pioneer Zephyr}, whose debut trip in 1934 was a record-breaking trip from Denver to Chicago, where it appeared as an exhibit at the “Century of Progress” Exhibition.\textsuperscript{704} The \textit{Pioneer Zephyr’s} dramatic name was not abnormal: Streamliner trains frequently had memorable names such as the \textit{Super Chief}, the \textit{City of Portland}, or the \textit{Forty-Niner}.\textsuperscript{705}

\textsuperscript{703} Stover 1961, p. 235.
\textsuperscript{704} Stover 1961, p. 234.
### Table 5.7: The results of a quantitative content analysis of newspaper opinion articles about railways from 1929 to 1942.

<table>
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</thead>
<tbody>
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<td>Railways in war.</td>
<td>0.15 0.5 0.25 0.25</td>
<td>0.1 0.1 0.1 0.08</td>
<td>0.05 0.05 0.05 0.05</td>
<td>0.05 0.05 0.05 0.05</td>
<td>0.05 0.05 0.05 0.05</td>
<td></td>
</tr>
<tr>
<td>The railways are over-regulated.</td>
<td>0 0.15 0.2 0</td>
<td>0 0.05 0.08</td>
<td>0 0.05 0.08</td>
<td>0 0.05 0.08</td>
<td>0 0.05 0.08</td>
<td></td>
</tr>
<tr>
<td>Praise for railway improvements.</td>
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<td>0 0.05 0.05</td>
<td>0 0.05 0.05</td>
<td>0 0.05 0.05</td>
<td>0 0.05 0.05</td>
<td></td>
</tr>
<tr>
<td>Railway business developments.</td>
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<td>0.05 0.05 0.05</td>
<td>0.05 0.05 0.05</td>
<td>0.05 0.05 0.05</td>
<td>0.05 0.05 0.05</td>
<td></td>
</tr>
<tr>
<td>Road competition with the railways.</td>
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<td>0.1 0.1 0.04</td>
<td>0.1 0.1 0.04</td>
<td>0.1 0.1 0.04</td>
<td>0.1 0.1 0.04</td>
<td></td>
</tr>
<tr>
<td>Service complaints.</td>
<td>0.1 0 0 0</td>
<td>0 0.05 0.03</td>
<td>0 0.05 0.03</td>
<td>0 0.05 0.03</td>
<td>0 0.05 0.03</td>
<td></td>
</tr>
<tr>
<td>Pleas to save the railways.</td>
<td>0.05 0 0 0</td>
<td>0 0.1 0.03</td>
<td>0 0.1 0.03</td>
<td>0 0.1 0.03</td>
<td>0 0.1 0.03</td>
<td></td>
</tr>
<tr>
<td>Railways are good for the economy.</td>
<td>0 0.1 0.05 0</td>
<td>0 0 0.03</td>
<td>0 0 0.03</td>
<td>0 0 0.03</td>
<td>0 0 0.03</td>
<td></td>
</tr>
<tr>
<td>Accidents and safety concerns.</td>
<td>0 0 0.05 0</td>
<td>0.1 0.1 0.03</td>
<td>0.1 0.1 0.03</td>
<td>0.1 0.1 0.03</td>
<td>0.1 0.1 0.03</td>
<td></td>
</tr>
<tr>
<td>Obstinate or unimaginative railways.</td>
<td>0 0.1 0 0</td>
<td>0 0 0.02</td>
<td>0 0 0.02</td>
<td>0 0 0.02</td>
<td>0 0 0.02</td>
<td></td>
</tr>
<tr>
<td>Opposition to railway nationalisation.</td>
<td>0 0.1 0 0</td>
<td>0 0 0.02</td>
<td>0 0 0.02</td>
<td>0 0 0.02</td>
<td>0 0 0.02</td>
<td></td>
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<tr>
<td>The railways are in crisis.</td>
<td>0 0 0 0.1</td>
<td>0.1 0.1 0.02</td>
<td>0.1 0.1 0.02</td>
<td>0.1 0.1 0.02</td>
<td>0.1 0.1 0.02</td>
<td></td>
</tr>
<tr>
<td>Railway rates are too high.</td>
<td>0 0 0 0</td>
<td>0 0.1 0.02</td>
<td>0 0.1 0.02</td>
<td>0 0.1 0.02</td>
<td>0 0.1 0.02</td>
<td></td>
</tr>
<tr>
<td>Critical discussion of railway consolidation.</td>
<td>0 0 0 0</td>
<td>0 0.1 0.02</td>
<td>0 0.1 0.02</td>
<td>0 0.1 0.02</td>
<td>0 0.1 0.02</td>
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</tbody>
</table>

Many commentators interpreted the appearance of the streamliners as evidence that the railways were finally taking some initiative to modernize their services, and genuinely making an effort to compete with the roads.\(^{706}\) This view was most commonly found in the *Chicago Tribune*,\(^{707}\) likely because Chicago was a mid-continental city where the trains tended to converge. In 1936, the *Tribune* enthusiastically recounted how “The circle is now complete and the railroads can point with pride to much-expedited schedules in every direction from Chicago.”\(^{708}\) The trains were also often praised for their luxurious appointments. One syndicated gossip column described the celebrity appeal of the new trains:

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What with the various new streamliners recapturing all but a small fraction of the transcontinental luxury and celebrity traffic for the railroads, covering the arrival and departure of the City of Los Angeles, the Super Chief, or the Forty-Niner at western cities along the route has come to be a recognized newspaper routine, just as ship news is in New York and other important ports.\textsuperscript{709}

The \textit{New York Times} argued that this attention was intentional on the part of the trains' designers, who were becoming “increasingly aware of the advantages of injecting a little glamour into rail travel.”\textsuperscript{710} This emphasis on glamour and celebrity, however, is also evidence of one of the streamliners’ most important weaknesses, namely that they were unaffordable to most ordinary travellers. Indeed, the trains were so expensive to run that they made very little profit.\textsuperscript{711}

Enthusiastic coverage of the streamliners in the railway press was most common in \textit{Railroad Stories}, which covered successful streamliner trains in a regular feature entitled “Trains that are Making Good”, which repeated some of the newspapers’ optimism about streamliners, presenting them as evidence that the railways were competitive again.\textsuperscript{712} One such column optimistically proclaimed that the success of streamliner services “lies in the fact that they all have given the traveller more in the way of speed, comfort and price than he has ever got before, and he has forsaken the competition—including the motor bus and his own car—to ride on them.”\textsuperscript{713}

Most railway journals, however, focused on regulatory issues, calling attention to the Interstate Commerce Commission regulations which restrained the railways, but not the roads, as well as the fact that the railways were taxed on their infrastructure, while road transport firms were subsidised for theirs. In a 1936 article objecting to commentator Walter Lippmann’s assertion that the railways were not progressive, \textit{Railway Age} did not point to streamliners or any other innovation to contradict him, but instead argued that the railways were the victim of unfair regulations:

\begin{quote}
the progress which Mr. Lippmann sees in the automotive industry, while it has undoubtedly occurred, has arisen primarily from an enormous highway subsidy. The progress in the design and price of automotive vehicles is an effect rather than a primary cause of improved efficiency in highway transportation. And it is an effect which would be secured on the railroads, and
\end{quote}

\begin{footnotes}
\item[711] Stover 1961, p. 235
\end{footnotes}
probably any other industry for that matter, by an application of a similar policy of subsidization.\textsuperscript{714}

Other railway journal editorials took a similar position,\textsuperscript{715} and frequently supported proposals to have the Interstate Commerce Commission regulate road transport. Newspaper commentators, especially those writing in the Chicago Tribune, often agreed with this story-line. One Tribune editorial complained that the railways were “afflicted increasingly by the competition of new, unregulated, and often subsidized forms of transportation, regulated in an extreme point, [and] forbidden in most cases to operate other than as rail vehicles.”\textsuperscript{716} In 1931, The Washington Post aggressively criticized the Interstate Commerce Commission for jeopardizing the railways’ finances by responding too slowly to requests for fare increases.\textsuperscript{717} On the grounds that the railways no longer posed any threat of a monopoly, many columns argued that rail transport was unfairly regulated, while road transport was unfairly subsidised.\textsuperscript{718}

\textit{Negative Story-Lines}

Negative story-lines about the railways interpreted the railway crisis differently, describing it as just comeuppance for railway managements, who it portrayed as unimaginative and resistant to innovation in addition to being exploitative. One version of this story-line emphasized the railways’ failure to implement new innovations, such as faster locomotives or lightweight rolling stock.\textsuperscript{719} Others argued that the railways should reduce their fares to save themselves.\textsuperscript{720} While some of these criticisms were phrased as constructive suggestions, others took the form of harsh indictments. A 1938 letter to the editor of the New York Times, for example, complained about the “crass stupidity of the railroads in persisting in their policy of looking upon the traveling public as natural enemies.”\textsuperscript{721}

\textsuperscript{714} Railway Age, 1936, ‘Mr. Lippmann Comments on the Transportation Situation’, 100 (23), pp. 903-904.


same year, a number of letters to the editor of the *Chicago Tribune* echoed this view.\textsuperscript{722} One of these, written by an ex-railway conductor, pointed to high fares and uncomfortable trains and claimed that “sheer stupidity of management in the passenger departments of railways continues to encourage people to travel by bus or automobile”.\textsuperscript{723} One correspondent in the *New York Times* argued that the railways “haven’t adopted a new idea since 1900”.\textsuperscript{724}

This story-line remained fairly marginal in the mainstream press, with service complaints accounting for just 3 percent of the articles surveyed in the quantitative analysis, and rate complaints or suggestions that railway managers were obstinate accounting for just 2 percent each while virtually nobody in the newspapers expressed concerns about a railway monopoly by this point (Table 5.7). This story-line did, however, attract the endorsement of some prominent political actors. The most prominent of these was Presidential candidate Franklin Delano Roosevelt, who endorsed this story-line when he proposed railway reform as part of his 1932 election platform, urging the railways to seek profitability by improving their business practices, and proposing withhold government aid for all but the most desperate railways.\textsuperscript{725} Roosevelt's proposals placed all the responsibility for saving the railways with the railways themselves, thereby implicitly endorsing story-lines which made the railways responsible for their plight.

As in the previous period, the characterisation of railways as obstinate, abusive and monopolistic was prominent in Congress, particularly in the opposition to the Parker Bill, which Representative Hare of South Carolina condemned as “a railroad bill”. Hare argued that “the evidence is sufficient to justify the conclusion that if [the railways] are not taking a vital interest in the proposed legislation, they are not living up to their well-known reputation.”\textsuperscript{726} The negative sense in which the phrase “railroad bill” is used suggests that this reputation was not a positive one. Representative John J, McSwain of South Carolina, suggested that any railway company that creates a new bus service in competition with existing ones “has some sinister motive,” and predicted that the railways would use predatory pricing to drive competing bus services out of business, using “busses of such elegance, of such luxurious equipment, of such conveniences, and make riding in their busses so attractive” that they could capture all the traffic.\textsuperscript{727} James J. Couzens, who spoke

\textsuperscript{724} Horn, E., 1932, ‘Railroads and Trucks’, 13 December, p. 8.
\textsuperscript{726} *Annals of Congress*, 71st Cong., 2nd sess., 5865.
\textsuperscript{727} *Annals of Congress*, 71st Cong., 2nd sess., 5868.
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frequently in the debates over the Parker Bill, argued that the railways were proposing amendments to the legislation, “so that they may control all methods of passenger transportation. That is the simple proposition involved...We may just as well not have any bus lines at all if they are going to be owned and controlled and operated by the railroads”. 728 Senator Clarence C. Dill predicted that the legislation would create a “monopolistic organization”, that would mean that “the rates on busses will be kept up with trolley and railroad rates to such an extent that there will not be any advantage to the people.” 729 This reflects the same populist, anti-trust attitude that prevailed in previous periods, particularly among Democrats, but here it was particularly powerful because, as the railways were the ones proposing legislative change, it no longer had the burden of proof.

The railways were not the only transport industry suspected of pursuing a monopoly in the debates around the Parker Bill, as by this time bus and truck companies were also accused of forming exploitative business trusts which needed to be regulated. 730 Even this argument, however, was sometimes made by reference to the history of the railways, as illustrated by Nebraska Senator and progressive leader Robert B. Howell: 731 “in 1920 the railroads came to Congress, just as the busses are coming to Congress now and said, ‘We are not getting enough money. We are entitled to more for our services”. 732 The railways were the archetypal transport monopoly, and as such no bill even vaguely associated with them could expect to pass through Congress easily. The Parker Bill failed to pass. 733 When a new proposal for the regulation of road transport passed in 1935, it had more to do with a perceived need for regulated road transport, rather than any sympathy for the railways. 734 The legislation, furthermore, contained too many exemptions for it to do very much to allow the railways to compete on a more even basis.

Debate about the Parker Bill in the newspapers was heated. One exchange in the letters section of the New York Times illustrates the talking points of the various stakeholders. In response to a pamphlet entitled “Bus facts for 1930”, arguing against bus regulation, 735 a railway union official analysed the relative tax contributions of the railways and the buses,
arguing that the buses’ use of public roads amounted to a massive subsidy.736 Another letter replied that: “the railroads were not regulated until their disregard of fundamental business principles bore so heavily on shippers generally that legislation was the only thing that would correct the practices then existing”.737 A third correspondent agreed, arguing that the railways’ current state of regulation was largely due to the fact that in their early history they had “looked almost solely to personal advantage”.738 Even when newspaper editors did not agree with the anti-railway sentiment, they still keenly felt its presence. In July, 1932, the editor of *The Washington Post* cited a widespread view that the railways aimed to drive motor competition out of business.739 *The Boston Globe* agreed that the public was still largely either oblivious or hostile to railway troubles.740

While the railways attempted to make a case that they, too, could be a part of a modern transport system if their regulations were loosened, and this story-line even caught on among some commentators, it was not decisive in the critical policy struggles that the railways needed to win. Streamliners did not have sufficient empirical credibility as a form of mass transport to effectively counter the view that the railways were obstinate and unimaginative. Finally, complaints about regulation suffered from a severe deficit of actor credibility on the part of railway managements, leading to the phrase “railway bill” being a very effective epithet against the railways in Congress. The durability of old story-lines about abusive railways thus played a key role in blocking reforms that the railways desperately needed during this period. The outcome of these regulatory struggles cemented the transition to a road-dominated transport system.

5.4.4. The First American Highways

*Positive Story-Lines*

As in the United Kingdom, story-lines about road transport during this period were overwhelmingly positive, portraying new roads as an exciting, futuristic, and essential transport infrastructure. Support for highway construction was the most common theme uncovered in the quantitative analysis of this period, accounting for 32 percent of the newspaper articles surveyed (Table 5.8). Half of all the themes that met the threshold for inclusion in table 5.8 supported highway construction. The railways rarely if ever factored

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into these discussions. Rather than maligning the railways, supporters of road construction simply ignored them.

Advertisements from this period often portrayed cars as adventure machines, placing cars in idyllic countryside settings (Figure 5.21). A similar story-line appears in the motor press. While most car journals during this period had turned their attention towards a professional audience, *Michigan Motor News*, published by the American Automobile Association for its members in the state of Michigan, frequently published descriptions of long-distance road tours radiating out from Michigan to destinations as far away as Yellowstone Park or Mexico. As with the advertisements, descriptions of these tours relied heavily on the language of adventure. One account of a tour from Michigan to the Southwest, for example, used narratives of the American frontier: “We were nearing the climax of a travel-adventure that had taken us over trails blazed by long extinct peoples and made famous by early pioneers and those indomitable spirits of ‘49”.

This description of cars as adventure machines is not new, but discussions of ordinary families engaging in long-distance road tours reflects two things. The first is that new road infrastructure had made motor touring a much more practical and comfortable means of travelling. By 1936, the average daily mileage on a road tour was up to 400, from just 125 in 1916. Better roads were accompanied by the growth of auto camps and the first motels, which catered to overnight travellers. The prevailing ideology of mass leisure, the development of national parks, and a general interest in outdoor recreation, meant that long-distance motor touring was ideally suited to the leisure preferences and opportunities of the time.

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741 The emphasis on Michigan does not reflect any particular historical concern, but instead is an artefact of the fact that motor journals were surveyed at the Henry Ford Museum in Dearborn, Michigan. This journal is therefore not likely to be fully representative of car-related discussions from other states, but it was the only such periodical available for this study.
743 Belasco 1979, p. 89.
744 Belasco 1979, p. 142.
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<tr>
<td>Support for highways.</td>
<td>0.10</td>
<td>0.47</td>
<td>0.32</td>
<td>0.35</td>
<td>0.35</td>
<td>0.32</td>
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<tr>
<td>Futuristic highway visions.</td>
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<td>0.47</td>
<td>0.00</td>
<td>0.10</td>
<td>0.25</td>
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<td>Highways improve road safety.</td>
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<td>0.21</td>
<td>0.00</td>
<td>0.35</td>
<td>0.10</td>
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<td>0.05</td>
<td>0.05</td>
<td>0.15</td>
<td>0.35</td>
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<td>Inadequate roads.</td>
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<td>0.05</td>
<td>0.20</td>
<td>0.00</td>
<td>0.06</td>
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<td>Highway aesthetics.</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.15</td>
<td>0.06</td>
</tr>
<tr>
<td>Concern about reckless drivers.</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.05</td>
<td>0.10</td>
<td>0.05</td>
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<tr>
<td>Highways will reduce congestion.</td>
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<td>0.16</td>
<td>0.00</td>
<td>0.00</td>
<td>0.05</td>
<td>0.05</td>
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<tr>
<td>Highways for national defence.</td>
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<td>0.00</td>
<td>0.26</td>
<td>0.00</td>
<td>0.00</td>
<td>0.05</td>
</tr>
<tr>
<td>Contrast between new and old roads.</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td>Separation of different kinds of traffic.</td>
<td>0.05</td>
<td>0.00</td>
<td>0.00</td>
<td>0.05</td>
<td>0.10</td>
<td>0.04</td>
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<td>Highway financing.</td>
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<td>0.16</td>
<td>0.00</td>
<td>0.05</td>
<td>0.00</td>
<td>0.04</td>
</tr>
<tr>
<td>Trucks monopolize or damage the roads.</td>
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<td>0.11</td>
<td>0.05</td>
<td>0.00</td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td>Praise for highways.</td>
<td>0.00</td>
<td>0.05</td>
<td>0.05</td>
<td>0.10</td>
<td>0.00</td>
<td>0.04</td>
</tr>
<tr>
<td>Motor touring or recreation.</td>
<td>0.10</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.05</td>
<td>0.03</td>
</tr>
<tr>
<td>New roads will provide jobs.</td>
<td>0.05</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.10</td>
<td>0.03</td>
</tr>
<tr>
<td>Railways are better suited to carry freight.</td>
<td>0.00</td>
<td>0.11</td>
<td>0.05</td>
<td>0.00</td>
<td>0.00</td>
<td>0.03</td>
</tr>
<tr>
<td>Domestic car industry.</td>
<td>0.00</td>
<td>0.00</td>
<td>0.11</td>
<td>0.00</td>
<td>0.00</td>
<td>0.02</td>
</tr>
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</table>

Table 5.8: The results of a quantitative content analysis of newspaper opinion articles about road transport from 1929 to 1945.
The evolution of discursive story-lines during socio-technical transitions

The construction of new roads was supported by story-lines portraying roads and highways as progressive and exciting. Futuristic visions of highways accounted for 16 percent of all articles surveyed in the quantitative analysis (Table 5.8), and were also prominent in Michigan Motor News’ coverage of road construction. It was also popular to describe roads as a crucial hallmark of civilization. Motor News at one point described new roads as “the physical sign or symbol by which you will best understand any age of people. If they have no roads, they are savages, for the roads is the creation of man and a type of civilization.” A similar story-line appears in a 1937 Boston Globe, opinion piece claiming that “transportation is fundamental to civilization. Those hard-surfaced roads into which treasure has been poured are the bonds of the Union of these United States.” This association of road construction with civilization reflects deep-seated American narratives.

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equating national progress with ‘taming the wilderness’. The Washington Post supported new roads for more pragmatic reasons, arguing that “Highways represent an investment that is absolutely essential under modern conditions”, and that “A state that fails to develop roads not only drives away profitable tourist traffic, but throttles its own commerce”. In 1930, the Post described the United States as the “country that has motorised the world and made good highways a modern necessity.” Describing the State of Hawaii in 1934, famous actor and humourist Will Rogers remarked that “This island must have all the best politicians. For they got the best roads. Over home a congressman is never better than his roads”. Road construction was also portrayed as a form of unemployment relief which could soften the blow of the depression.

The 1939 World’s Fair in New York City hosted exhibits from all three major car companies, all of which promoted a similar vision of a future highway network. General Motors’ massive Futurama exhibition, the most famous of these, gave visitors the opportunity to board motorized cars shaped like airplanes, for an aerial tour over an enormous diorama of the United States as it would exist in 1960. After flying over a country crisscrossed by efficient, smoothly-flowing motor highways, attendees exited their airplanes to find themselves in a full-sized mock-up of an urban intersection in 1960, where they could look down from an elevated pedestrian concourse onto the smoothly flowing traffic below. According to a Gallup poll, Futurama was the most popular exhibit at the fair, but it was not the only display of its kind. Ford presented a “City of Tomorrow” exhibit (Figure 5.22), showing “immense skyscrapers surrounded by verdant parks and broad roadways,” while Chrysler’s exhibit featured a “huge animated map”, which showed human progress in transport from the days when “foot-power was his only form of transportation”, to the motor highways of the future. The railways put on their own exhibit depicting the progress of rail transport from early steam trains to modern

749 Robertson 1980, p. 115.
streamliners, but it was far less popular. The Gallup poll ranked it seventh, just below an exhibit put on by the Soviet Union.\textsuperscript{759}

The media coverage of these exhibits was extremely favourable. A New York Times piece on Futurama described the “great and orderly metropolis” that the simulated flight revealed when it reached urban areas.\textsuperscript{760} Another article suggested that “one might think that this was a foretaste of Utopia. The crowds seemed to think so”.\textsuperscript{761} The Washington Post described the exhibits as depicting “The geometric streets and highways of the world of tomorrow”.\textsuperscript{762} One lengthy New York Times opinion piece described the exhibits as evidence of hope in the midst of the depression: “For the fair is more than an oasis in a troubled world. It is even more than the World of Tomorrow. It is, at best, a summary of the hopeful things that exist in the world now”.\textsuperscript{763}

Dissent against these pro-highway story-lines was limited to minor quibbles about road financing, the specific design of the roads, or the way the construction would be organized. These concerns did not constitute any recognizable anti-road or anti-car story-line. A 1930 *Washington Post* article criticized Roosevelt’s plan to finance road construction through the sale of bonds, but conceded nevertheless that the improved highways were a good idea.764 A 1932 article observed that “Road building has become such a popular modern fetish that any word of criticism is a jarring note”, but advocated better-designed roads, rather than abandonment or scaling back of road construction programmes.765 When Harvard University president Dr. James B. Conant toured the Fair with New York City Parks Commissioner Robert Moses, he questioned how the roads would be funded, but nevertheless agreed that the vision was appealing.766 Harsher criticism appeared in the *Chicago Tribune* in 1939, when it argued that new roads were frequently little more than political favours.767 Most newspaper coverage, however, was relentlessly positive about the new road projects.

Road vehicles elicited slightly more critical commentary. In particular, commercial vehicles such as trucks and buses were alleged to endanger and inconvenience the drivers of private cars. Some of these concerns emerged during the debate over the regulation of motor transport by the Interstate Commerce Commission, and may in fact have played a role in motivating the eventual passage of regulations for road transport. Alben W. Barkeley, the Parker Bill’s chief supporter in the Senate, who would become Vice President under Harry Truman, argued that “In many sections of the country already it is dangerous to proceed up and down the public highways because of what a very famous Kentucky judge called the ‘numerosity’ of busses on the highways”.768 Barkeley claimed that “public highways were constructed and dedicated for the benefit of all the people …if there are more busses on a highway than are really needed for the convenience of the public, to that extent those busses interfere with the primary object of the creation of the highway”.769 This concern, however, did not translate into support for the railways. By focusing on the rights of individual motorists over commercial vehicles, these comments presume a large role for road transport in the future. The debate over transport was thus beginning to shift to be

769 Ibid.
The evolution of discursive story-lines during socio-technical transitions over differential rights to a shared single infrastructure, rather than about the balance between two parallel infrastructures. The railways were being forgotten.

5.4.5. Conclusion

One explanation for why American road vehicles was lavished with new roads during this period, while the railways were actively hindered by regulators is that road transport was attached to more reliably favourable story-lines. As in the United Kingdom, this made it more politically attractive support highway construction than to support the railways. This period, like its British counterpart, therefore illustrates the importance that story-lines can have in policy debates during the overthrow phase of a transition.

This period gives further evidence of the importance of narrative fidelity during the overthrow phase. As road transport began to compete with the railways, the railways lost the advantage in empirical credibility they had enjoyed as the sole established system. They responded by making a play for narrative fidelity by promoting story-lines of renewal and modernisation, many of which featured streamliner trains. Railways, however, were a much older technology than motor vehicles, and so even the streamliners struggled to appear modern next to the grandiose highway visions on display at the 1939 World’s Fair. The railways’ story-line about onerous government regulations, meanwhile, lost out on actor credibility due to a widespread mistrust of railway actors, as legislation that would have levelled the legislative playing field was condemned due to fears of predatory pricing, or merely on the grounds that it was a “railroad bill”.

The cultural landscape during this period gave an important advantage to positive story-lines about the railways. The demand for unemployment relief made expensive government infrastructure projects more palatable, while an enthusiasm for technocracy made them more exciting. This emphasizes the role of narrative fidelity as a decisive factor in the discursive conflict between two equally credible regimes.

Another interesting finding of this period relates to the “sailing ship effect”, which innovation scholars have posited occurs when an incumbent regime suddenly implements significant innovations once it is challenged by a radical technology. This case suggests that it can exist on the level of story-lines, with supporters of an incumbent regime using new innovations as a discursive strategy against their challengers. The positive response to the streamliners suggests that ‘sailing ship’ innovations can be useful as a way for incumbents to attract public support through dramatic technological demonstrations.
One important mismatch between this period and the analytical model is the conspicuous lack of any direct engagement between the supporters of road and rail transport. Road actors simply expanded their own regime without giving very much heed to the declining rail regime and the story-lines its supporters promoted. This might be partly due to the fact that the crucial overthrow struggle over regulation was inverted. The analytical model assumes that struggles during this period occur as challenger regime actors attempt to change policy paradigms to favour their own interests. In this case, however, due to a pre-existing mistrust of the railways, policy paradigms were already favourable to motor transport, and it was railway actors trying to change them in order to defend their own system. This might have allowed a certain degree of complacency on the part of road transport actors. The same newspapers that printed editorials sympathetic to the plight of the railways due to unfair subsidies also printed enthusiastic endorsements of those very same road subsidies. The analytical model’s suggestion that the overthrow period involves direct contestation between incumbent regime actors and niche proponents therefore is not supported by this case. The railways were already badly undermined by this point, due to persistent negative story-lines against them, and the resultant strict regulations, meaning that supporters of road transport were free to spend more time promoting their own story-lines. This mismatch will be discussed in more detail in the concluding chapter of this thesis.
The evolution of discursive story-lines during socio-technical transitions

5.5. Period IV: Regime Maintenance (1945-2001)

5.5.1. Introduction

The American road transport regime stabilized after the end of the Second World War. Post-war prosperity in the United States encouraged a rapid rate of motorisation and suburbanisation,\(^{770}\) causing the total distance travelled by private automobile to increase rapidly (Figure 5.23). This was associated with a rapid expansion of road infrastructure, most notably in the form of the Interstate Highway System, which was begun in 1956. The growing use of cars caused public concern about issues such as smog, congestion, fuel crises, and the effects of highways on the cities and towns they passed through.\(^{771}\) By the 1960s, these concerns were being used to support campaigns for revitalized mass transit in order to relieve the pressure on the roads.\(^{772}\) Unlike in the United Kingdom, however, these campaigns did not lead to any new policy agendas, and the total distance travelled by road continued to increase into the new millennium.

![Figure 5.23: American surface passenger transport, 1945-2001. Data from Cain, 2006.](image)

The commercial fortunes railways deteriorated rapidly from the end of the Second World War (Figure 5.24), and by 1951, American railway mileage was down to less than 220,000 miles.\(^{773}\) In 1971, the Federal Government rescued what was left of the country’s passenger railways by creating Amtrak, a government-subsidized public railway company which bought out passenger train routes from their private owners.\(^{774}\) Amtrak faced ongoing financial strains and required constant subsidies, which made it a tempting target for

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\(^{770}\) Tindall and Shi 2000, p. 1104.
\(^{772}\) Nelson Dyble 2009, p. 636.
\(^{773}\) Stover 1961, p. 211.
\(^{774}\) Wolf 1996, p. 80.
budget cutters. Several Presidents, including Jimmy Carter, Ronald Reagan, and George H.W. Bush, proposed cuts to Amtrak since its founding,\textsuperscript{775} putting passenger rail into a near-constant state of political controversy during this period.

Positive story-lines about the car regime during this period most often portrayed cars as an essential system, for which there was no viable alternative. Negative story-lines about the car regime often emphasized problems that affected motorists themselves, such as congestion and car accidents. Because these story-lines were typically phrased in a way designed to appeal to motorists, they did not offer a rationale for moving away from a car-based transport system. In struggles over the collapse of the nation’s passenger rail infrastructure, and, later, over the question of Amtrak’s subsidies, a positive story-line portrayed the railways either as a pleasantly nostalgic transport system, or as a promising alternative to the problems on the roads. Negative story-lines, meanwhile, portrayed the railways as fundamentally obsolete, and portrayed Amtrak as an over-subsidized boondoggle. All of these story-lines fluctuate in popularity and interact with each other throughout this period, and so this section has not been divided up on the basis of positive and negative story-lines, but instead has been presented as two chronological narratives, each of which has been divided into three chronological periods.

5.5.2. The Cultural Landscape

Post-war prosperity in the United States led to a mood of optimism about the future of the economy, which many Americans believed would remain strong indefinitely, propped up by a government that would responsibly manage it for the indefinite future. This optimism also led to the promotion of a lifestyle based on conspicuous consumption, which encouraged car ownership as a middle-class aspiration.

This optimism was challenged in the 1960s by political struggles, such as the civil rights movement, student unrest, and, most importantly for this discussion, a new environmentalist movement that had appeared by 1967, leading to the first Earth Day in 1970. Concerns about the environmental limits of industrial society remained an important political cause throughout the 1970s, particularly in light of the two oil crises of 1973 and 1979, which established a connection between environmental concerns and transport policy. In 1979, President Jimmy Carter called for drastic measures to conserve the country’s energy resources. Carter, however, was swept out of office by Ronald Reagan’s landslide victory in the 1981 election. Reagan’s scepticism of government intervention in the economy, which was adopted even in the Democratic Party, made government action to address the problems of the car regime politically unpalatable, and also attracted scrutiny to Amtrak’s subsidies.

5.5.3. Ongoing Stability in the American Road Regime

Optimism in the Post-War Period, 1945-1959

The rapid move towards car ownership at the end of the Second World War fit in well with the economic optimism of the post-war period, as commentators described mass car ownership as an indicator of national progress and prosperity. This does not show up prominently in opinion journalism from the period, but it is evident in newspaper coverage of motor shows. When it covered the 1953 Los Angeles Auto Show, the Los Angeles Times wrote of “the grip taken on the public mind by the great king of the

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777 Tindall and Shi 2000, p. 1102.
784 Tindall and Shi 2000, pp. 1291-1293.
highway—the automobile.” An article published in The Baltimore Sun about Baltimore’s local show in 1953 optimistically observed that “America moves on automobile wheels, and the life of the country, both rural and urban, is geared to the vehicle which nowhere else is produced in such huge numbers.” The editor of The New York Times, after visiting the 1949 New York car show, remarked that “It would be difficult to visit the General Motors exhibit and come away lacking faith in the productive genius and essentially forward-looking character of American industry.” For a generation which had lived through the Great Depression and a war, a future with mass car ownership seemed a welcome relief. Even the cultural critics of the time did not criticise the automobile. Jack Kerouac’s On the Road, for example, celebrated as a reaction to the alienation of the 1950s, nevertheless places its protagonist in the driver’s seat of a car. The most acute criticisms of the car regime in the late 1940s and early 1950s had to do with Detroit’s slowness in making them available.

As the road regime consolidated itself, car magazines confidently portrayed cars as a crucial necessity of modern life. This is demonstrated by Motor News’ repeated suggestions that drivers’ training should be a standard class in high schools, as well as Motor Trend’s assertion that the word ‘pedestrian’ “may be more accurately interpreted to mean a human being who, for the moment, is not behind the wheel of an automobile”. Motor News wrote in 1956 that the country had become “a nation on wheels. No section of the country is remote from even the lowest-paid worker here. Everyone wants his own car, and one way or another gets it.” Newspaper discussions of driving also reflected this belief that cars had become essential. A letter to the editor of New York Times agreed, arguing that

The farmer and rural inhabitant can no longer return to the use of the horse and buggy for his transportation, so that the automobile becomes a vital necessity to them. The expansion of suburban living is predicated on the use of the automobile not only for breadwinning but for the housewife as well who uses the family car for marketing.

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788 Tindall and Shi 2000, p. 1119.
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<table>
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<tr>
<th></th>
<th>Boston Globe (20)</th>
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<th>New York Times (20)</th>
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<td>0.05</td>
<td>0.1</td>
<td>0.06</td>
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<td>0</td>
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</table>

Table 5.9: The results of a quantitative content analysis of newspaper opinion articles about road transport from 1945 to 1959.

Car advertisements from this period also reflect this optimism, portraying cars as objects of freedom and excitement, and often depicting them speeding along picturesque rural roads (Figure 5.25). When combined with the story-lines promoting cars as essential or as indicators of prosperity, this created a potent story-line in which cars were not only the sole viable means of transport in the United States, but also an eminently desirable one.

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There were no significant negative story-lines about the car regime during this period, but there was some consciousness of problems within it. A survey of editorial articles and letters to the editor about automobiles in the immediate post-war years reveals concern about both accidents and congestion (Table 5.9). The prevailing solution to these, however, was to expand the car regime by building new, more spacious, and safer highways, rather than supporting alternative means of transport. This translated into support for the construction of the interstate highways, which began in 1956. *Motor News* cited a wide variety of opinions about how to deal with congestion, but argued that “On only one major premise is everyone agreed. America needs more and better roads.”

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of the newspapers surveyed, except the Los Angeles Times, printed suggestions that new roads were the solution to congestion.

The arguments used to support the interstate highways can be grouped into three categories of safety, efficiency, and defence; all of which are neatly outlined in Senator Thomas Kuchel's Congressional speech advocating for highway investment:

[The President's Commission] demonstrated the urgent need of an Interstate Highway System, based upon four compelling reasons. It pointed out that the military needs of the people of the United States in this thermonuclear age demand an Interstate System upon which rapid transportation of the military can be made available from one corner of our land to the other...The commission went on to point out that ...we operate our economic machine in very large part through constant use of the highways of America. The commission gave a fourth reason which will appeal to most of the people of the Nation. It concerns itself with the social aspect of the program. In 1955, almost 40,000 people were slaughtered on American highways. We did not lose that many American military personnel during the entire Korean conflict.799

The defence argument occurred primarily in Congress itself, where it was argued that highways would prove essential in the event of a nuclear attack.800 This argument appears occasionally in the newspapers, most notably in the Washington Post, whose readership may understandably have been more concerned about a nuclear attack. One letter to the editor of the Boston Globe asked “how [the civil defence authorities] can evacuate cities and towns on to the few highways going west. I can’t get onto the highways now, as they are overcrowded”. 801 Newspapers, however, were far more concerned about everyday problems with the road infrastructure than they were about nuclear war. The most prominent of these was the issue of safety. A New York Times editorial noted that obsolete highways were responsible for “a death toll of 38,300 in 1955, 1,350,000 injured more than $4,000,000,000 in property damage suffered.”802 A Washington Post article complained about the rejection of a study to “curtail slaughter on the nation’s highways”.803 This argument was also popular in car magazines, where Motor News called the interstate highways “super safeways”804 and in Congress, where representatives and senators used dramatic language about the accident rate.805

800 Annals of Congress, 84th Cong., 2nd sess., 7124, 7134.
Another concern was over congestion, which was tied to an inexorable increase in car ownership and traffic volume, and which could only be addressed by building new highways. Senator and former Kansas Governor Frank Carlson described the problem: “Almost unbearable traffic congestion is steadily growing worse in many places on our highway system, and it must be relieved.” Motor News argued that “in the interests of safety and efficient traffic movements, we must bring our road systems into reasonable harmony with today’s traffic requirements.” The editor of the Washington Post argued that: “with the great new volume of auto production and the rise in population a vast road program in which the federal government takes a leading role is far overdue.”

Dissent against the interstate highway programme was rare. The only objections to the Interstate Highways Act bill in Congress were over peripheral concerns, such as the lack of interstates in Alaska concerns about the workers building the highways, or controversies about how they would be funded. Some occasional substantive objections occurred in the newspapers, complaining about the displacement of people necessary to make way for “more unsightly patches of concrete ribbon”, as they were described by one correspondent in the Baltimore Sun. Other commentators proposed mass transit as a substitute for new highways. The quantitative analysis reveals widespread concern about how the highways would be funded, although the plan to raise funds through a fuel tax met with general approval. These concerns did not generally translate into a widespread critique of the interstate programme, and in general newspapers were very excited about

813 Annals of Congress, 84th Cong., 2nd sess., 9089.
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the roads, portraying them as both essential and exciting. An editorial in *The Washington Post* considering the debate over the 1956 Interstate Highways Act agreed that “Fewer measures considered by the present Congress are of greater interest to the rank and file citizens than the highway bill.” The editor of the *New York Times* praised the new roads, noting that “we may at last be matching engineering excellence of the road to today’s automobile”.

As the interstate highways were completed in the early 1960s, they were met with enthusiastic approval. In 1961, *Motor News* called the recently completed Interstate 94 through Michigan “A Dream Come True,” and proclaimed that “Michigan is shrinking. Trips that once took hours take minutes today.” Newspapers also praised the highways, with support for further road investment appearing in every newspaper surveyed except the *Washington Post*. A writer in the *Chicago Tribune* gushed at the ability to “be able to drive so many miles without a single crossing at grade; without a single stoplight; with no bothersome hills or curves of any consequence.” The combined enthusiasm over both roads and cars led to a powerful positive story-line. As the *Los Angeles Times* put it, “In America, one travels like a king by automobile.”

Second Thoughts, 1960-1979

From the end of the 1950s, as problems such as congestion and accidents persisted despite the construction of the interstates, concerns about the highway system emerged (Figure 5.26). These were a common theme in the newspaper articles of this period (Table 5.10). The *Chicago Tribune* predicted that if the President and his advisers were to tour the nation’s highways, “In and around most cities they would find great congestion, even on the new roads designated as part of the interstate expressway system…The Chicago expressways being financed under the interstate program are so badly needed that they are expected to be jammed as soon as they are completed” This editorial does not question their premise.

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of the highways, and indeed explicitly states that the solution to the problem is to build even more of them. Many editorials from this time took a similar line, although a few of these expressed concern about the fuel tax increase that this would necessitate.\footnote{\textit{Washington Post}, 1959, ‘Paying for Highways’, 22 June, p. A10; Curran, J.J., 1959, ‘Benefits from highways’, \textit{New York Times}, 5 April, p. 26.}

Other commentators, however, began to develop an anti-interstate story-line which questioned the desirability of a transport system based on the roads. A 1962 letter to the editor of the \textit{Boston Globe} complained that “We pour fantastic sums into road building and uproot thousands of families in their wake…Huge traffic jams are commonplace…Highway deaths are tremendous. When are we going to learn that the auto has created a problem that no amount of road building will solve?”\footnote{E.S., 1962, ‘The Answer: Lure People to Trains, Buses and Subway’, \textit{Boston Globe}, 20 August, p. 10.} This story-line emphasized the effects of the new roads on people living nearby. The editor of the \textit{New York Times} argued that the city should “Stop putting up the welcome sign to the private auto,”\footnote{\textit{New York Times}, 1965, ‘Inviting the Unwanted Auto’, 3 July, p. 18.} and warned that “Unless the entire countryside is to be carpeted in concrete, highways cannot sustain the increased burden”.\footnote{\textit{New York Times}, 1965, ‘Federal help for rails’, 4 September, p. 20.} A correspondent in the \textit{Chicago Tribune} agreed that transit improvement was essential, in order to avoid a scenario in which there would be “no space left downtown with the increasing noxious odors and fumes to threaten the future health and comfort of the community”.\footnote{Kelly, J., 1965, ‘A Loop Subway for Rapid Transit Plans’, \textit{Chicago Daily Tribune}, 20 September, p. 20.}
The evolution of discursive story-lines during socio-technical transitions

Figure 5.26: George Lichty's *Grin and Bear it* comic strip was particularly sceptical of the state of the highways.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Boston Globe (20)</th>
<th>Chicago Tribune (20)</th>
<th>Los Angeles Times (20)</th>
<th>New York Times (20)</th>
<th>Washington Post (20)</th>
<th>All Newspapers (100)</th>
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<td>0.06</td>
</tr>
<tr>
<td>Highway aesthetics.</td>
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<td>0</td>
<td>0.15</td>
<td>0</td>
<td>0.06</td>
</tr>
<tr>
<td>Trucks monopolizing or damaging highways.</td>
<td>0</td>
<td>0.2</td>
<td>0</td>
<td>0.05</td>
<td>0.05</td>
<td>0.06</td>
</tr>
<tr>
<td>Concerns about car crime.</td>
<td>0.15</td>
<td>0</td>
<td>0.05</td>
<td>0</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>Criticism of Detroit automakers.</td>
<td>0.05</td>
<td>0</td>
<td>0.1</td>
<td>0</td>
<td>0.1</td>
<td>0.05</td>
</tr>
<tr>
<td>Fuel economy or fuel crisis.</td>
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<td>0.05</td>
<td>0.05</td>
<td>0.1</td>
<td>0.05</td>
</tr>
<tr>
<td>“Carnage on the roads”</td>
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<td>0</td>
<td>0.1</td>
<td>0</td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td>Congestion.</td>
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<td>0.15</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.04</td>
</tr>
<tr>
<td>Cars as a nationalist icon.</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Table 5.10: The results of a quantitative content analysis of newspaper opinion articles about road transport from 1960 to 1979.

One 1959 editorial in the *Boston Globe* fondly imagined a future scenario in which the fuel supply had run out, forcing people to leave their cars at home:
Children were the first to discover that the street, previously forbidden as outrageously dangerous, made a wonderful playground... In almost no time there were people who would actually walk down to the corner store. Some even got in the habit of staying home and getting acquainted with their neighbours. Many friendships were formed.\textsuperscript{831}

In 1961, these concerns about the effects of highways on urban environments were given a more substantial airing with the publication of Jane Jacobs’ \textit{The Death and Life of American Cities}, which argued that American urban planning, particularly on the questions of transport, was fundamentally misguided. Jacobs was no anti-car radical. Her book, in fact, argued against pedestrianisation schemes, and described the fundamental problem of urban planning as “How to accommodate city transportation without destroying the related intricate and concentrated land use”.\textsuperscript{832} Jacobs’ critique of the car regime, however, was more thorough than any prominent publication that had come before. The start of the book’s chapter on cars in cities reads as follows:

\begin{quote}
Traffic arteries, along with parking lots, gas stations and drive-ins, are powerful and insistent instruments of city destruction. To accommodate them, city streets are broken down into loose sprawls, incoherent and vacuous for anyone afoot. Downtowns and other neighbourhoods that are marvels of close-grained intricacy and compact mutual support are casually disembowelled. Landmarks are crumbled or are so sundered from their contexts in city life as to become irrelevant trivialities. City character is blurred until every place becomes more like every other place, all adding up to Noplace.\textsuperscript{833}
\end{quote}

Jacobs describes a dystopian feedback loop in which more cars demand increased road and parking space, which in turn spreads out a city’s amenities, putting even more cars on the roads. According to Jacobs, the point of equilibrium between cars and road space therefore lies “beyond the point of safety from other human beings for persons afoot upon streets. It lies beyond the point of the casual city public life. It lies far beyond the point of any relationship between investment and productivity”.\textsuperscript{834} \textit{The Death and Life of Great American Cities} enjoyed a charitable reception, receiving favourable reviews in \textit{The Wall Street Journal},\textsuperscript{835} and \textit{The Los Angeles Times},\textsuperscript{836} both of which openly agreed with Jacobs’ unflattering description of urban landscapes. Part of the reason for the fact that these

\textsuperscript{832} Jacobs 1961, p. 340.
\textsuperscript{833} Jacobs 1961, p. 338.
\textsuperscript{834} Jacobs 1961, p. 335.
concerns emerged much sooner in the United States than in the United Kingdom may have been that American interstates, unlike British motorways, were built through cities from the very beginning.\textsuperscript{837} This caused large numbers of displaced urban residents to question the road programme, leading to a struggle over it that might not have otherwise existed. This is further support for the idea that negative story-lines about an incumbent regime draw support from highly visible unsolved problems of that regime.

Another very public criticism of the car regime came in 1965, when attorney Ralph Nader’s book, \textit{Unsafe at Any Speed} criticized the safety record of the major car companies. Nader described cars as a technology which “has brought death, injury, and the most inestimable sorrow and deprivation to millions of people”\textsuperscript{838} Nader also gave detailed consideration to urban air pollution,\textsuperscript{839} though he described this primarily as a hazard for drivers.\textsuperscript{840} \textit{Unsafe at any Speed} caused enough of a stir that in 1966, \textit{Car and Driver} published a series of statements from major car companies on automotive safety in order to disprove Nader’s central premise about negligent car companies.\textsuperscript{841} Nader became an authority on car safety and the shortcomings of Detroit, and his remarks on the car industry were routinely covered by newspapers during the 1960s.\textsuperscript{842} When combined with Jane Jacobs’ concerns, this contributed to a negative story-line portraying cars as a technology that destroyed cities and killed people.

This story-line motivated a modest change in policy agendas. It did not inspire any wholesale questioning of the car regime in the political sphere, but it did start to build support for improved public transit systems. Presidents John F. Kennedy and Lyndon B. Johnson both advocated investment in urban mass transit,\textsuperscript{843} with the latter invoking Jane Jacobs’ argument that “there is not enough housing for our people or transportation for

\begin{footnotesize}
\begin{itemize}
\item[\textsuperscript{837}] Karner 2013, p. 42.
\item[\textsuperscript{838}] Nader 1965, p. vii.
\item[\textsuperscript{839}] Nader 1965, p. 148.
\item[\textsuperscript{840}] Nader 1965, p. 150.
\item[\textsuperscript{841}] \textit{Car and Driver}, 1966, ‘Saab on Automotive Safety’, 12 (4), pp. 55-58, 79.
\end{itemize}
\end{footnotesize}
The evolution of discursive story-lines during socio-technical transitions

our traffic. Open land is vanishing and old landmarks are violated”.

Proposals for railways or public transit as an alternative for the overburdened highways were the most common theme of editorial coverage from the 1960s and 1970s, accounting for 21 percent of the articles surveyed and 40 percent of the articles surveyed in the New York Times, whose writers, due to their location, might have felt the influence of congestion and car accidents more than many others. Concerns about pollution, urban decay, and congestion were also prominent (Table 5.10).

By the mid-1960s, even in the motor press, the interstate highways were no longer the objects of excitement they had been ten years before. A 1966 article in Car and Driver describes the highways as boring compared with the older, and slower, parkways: “One day was spent droning across the interstate highways of North Carolina, and after an unrewarding night in Asheville, we rose at dawn and took the Blue Ridge Parkway. Now that’s a road”.

The mainstream press was more aggressive. The motor press of the 1960s often proposed incremental adjustments, such as compact or electric cars, as solutions to problems in the road transport regime. In order to make highways more attractive, planners proposed urban “mega-structures”, which include housing and commercial spaces to accompany the highways (Figure 5.27). Historian Phil Patton argues that these proposals “simply represented all the bonuses that had to be added to expressways to make them at all palatable to the public”.

Even with these bonuses, by the late 1960s new highways faced an increasingly vigorous protest movement, motivated by a combination of counter-culturalism, civil rights concerns about the fact that new urban highways were invariably located in black neighbourhoods, and the anti-highway story-lines promoted by actors such as Jane Jacobs. Historian Raymond Mohl provides a good example of the story-lines used by this movement in a quotation from Baltimore Sun reporter James D. Diltz, who scoffed that “‘Blending’ a six or eight-lane highway into the fabric of Baltimore is about as promising as ‘blending’ a buzz saw into a Persian rug.”

Like John Tyme in the United Kingdom, these protesters used procedural tactics to disrupt the planning process for new highways, and

848 Mohl 2004.
849 Mohl 2004, p. 693.
because of the less centralized structure of government in the United States, these tactics were successful at blocking highways in jurisdictions where local laws, planning regulations, and political leaders supported the activists’ efforts.\textsuperscript{850} Unlike Tyme, however, members of this movement emphasized the roads’ effects on cities, rather than concerns about the countryside. This illustrates the influence of the cultural landscape on the strength of anti-regime story-lines. While anti-highway protesters in the United Kingdom drew on a long-standing ruralism, anti-highway protesters in the United States drew on urban concerns which were prominent during the 1960s and 1970s.

\begin{figure}[h]
  \centering
  \includegraphics[width=\textwidth]{image.png}
  \caption{A 'megastructure' highway proposed in the late 1960s to be built in Lower Manhattan, which would have incorporated shopping and housing space above the roadway. From Patton 1986, p. 96.}
\end{figure}

Despite increasing concerns about the effects of cars, however, most people were still drivers, and so many articles expressing frustrations with the car regime framed them in terms of their effects on motorists. As in 1930s, this led to condemnations of large commercial vehicles such as trucks and buses, which were accused of bullying smaller private cars off the roads and damaging the highways.\textsuperscript{851} Negative story-lines about the road regime thus did not always encourage the development of any alternative system.

A similar incremental, motorist-focused approach was common in the car journals’ responses to the 1973 and 1975 oil crises. \textit{Car and Driver} stated frankly in a 1975 editorial that “It's time to admit our cars are too big”, and suggested some new taxes and laws that

\textsuperscript{850} Ibid.
The evolution of discursive story-lines during socio-technical transitions would promote energy efficiency (Figure 5.28). In the run-up to the 1979 fuel crisis, *Car and Driver* promoted “Five sport coupes that offer all the fun you can stand at 20 mpg”. Newspapers also proposed incremental solutions to the fuel crisis, most commonly a widespread adoption of ethanol or other alternative fuels, but some newspaper commentators began to look beyond incremental changes to the car regime. A slate of letters published in the *Washington Post* in 1979 criticized the country’s profligate fuel use while suggesting that a reduction in the country’s dependency on cars would also reduce the rates of accidents and congestion. Scepticism of the car regime led to the popularisation of a conspiracy theory, which held that car companies in the 1920s and 1930s had bought out streetcar companies with the explicit intention of shutting them down or converting them to buses, thereby making cities more dependent on cars. This view was held by some prominent people, including Senator Edward Kennedy, and Bradford C. Snell of the Senate’s antitrust subcommittee, who organized a series of hearings on the matter. While this story is probably not true, its popularity at the time suggests an increasing dissatisfaction with the car-based transport system.

![Redacted]

Figure 5.28: An illustration from a *Car and Driver* article arguing that cars are too big.


The growth of concern about the car regime is also evident in President Jimmy Carter’s 1979 speech addressing the oil crisis, which urged Americans to “take no unnecessary trips,

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to use carpools or public transportation whenever you can, to park your car one extra day per week, to obey the speed limit, saying that every act towards energy conservation “is an act of patriotism.”

By this time, however, a backlash had emerged, with new defensive story-lines portraying the car regime as a fundamental part of American culture that was under siege by hippies and bureaucrats. Car magazines of the 1970s became aggressive towards environmentalism. In 1973, Motor Trend argued that “The Environmental Protection Agency wants to shut down America”, blaming the fuel crisis on emissions standards that reduced engine efficiency. In 1971, Car and Driver predicted an apocalyptic 1984 where over-regulation had made cars “so expensive and cumbersome that few would want to buy them even if Congress were to relent.”

Backlash and Stalemate, 1980-2001

During the 1980s and 1990s, many of the same concerns about the car regime persisted and began to develop into a story-line portraying road transport as an unsustainable system that threatened American cities and national security. The quantitative analysis reveals that accidents remained the most common topic of newspaper opinion coverage, while twelve percent of opinion articles about cars promoted railways or public transit as alternatives to roads and highways, while a scattering of newspaper articles continued to call attention to problems such as congestion and urban blight caused by highways (Table 5.11).

Even Car and Driver at one point praised high-speed rail as an efficient transport system with “the potential to relegate long-distance travel by Porsche Turbo to second-best status”. One correspondent in the Chicago Tribune complained that the expanding car regime led only to “More neighbourhoods cut up by highways, more pollution drifting in through our open windows, more people driving alone in cars to work, more dependence on foreign oil.”

Some letters to the editor appeared promoting the under-rated joys of a car-free life-style. One such correspondent in the Los Angeles Times argued that “Not using a car very often is

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The evolution of discursive story-lines during socio-technical transitions

real freedom. Walking enables me to meet neighbours, get exercise, stop to watch a butterfly, collect thoughts.’ 866

At the same time, however, the backlash from the car regime intensified, as car magazines launched an attack on government regulation. In 1986, the editor of Car and Driver praised the repeal of energy conservation measures from the 1970s, 867 and in one article blamed their occurrence in the first place on Ralph Nader: “I’m not sure that old Ralph would ever have liked this country too much. It’s always been too rowdy, too robust, too willing to test the limits. This country—and the economic system that it developed—have always rewarded the taking of risks. Ralph and the Safety-Nazis are opposed to risk-taking in all its forms”. 868 Support for the car regime also persisted in the mainstream press, with support for road construction appearing in 8 percent of the articles considered in the quantitative survey. One letter to the editor of the New York Times defiantly praised the American car system as “the most advanced mass-transit system in the world.” 869 Another called cars “the last bastion of individual liberty”. 870 These arguments still rely on a positive story-line about motoring that dates back to the 1950s, portraying cars as both pragmatic necessities and symbols of American liberty, illustrating both the staying power of regime story-lines, and the value of a stable cultural landscape for an incumbent regime.

Discourse about transport during this period had thus reached a stalemate which favoured the road regime. Positive story-lines portraying cars as modern necessities, or as emblematic of freedom, were strong enough to prevent any new policy agendas from challenging the road regime, while critics of the road regime were relatively modest, often phrasing their critiques in terms of their implications for drivers and calling only for incremental solutions. Some protest movements against road construction emerged, but their basis in local urban controversies, and their tactical dependence on municipal and state-level institutions limited their national resonance. Their dependence on shorter-lived elements of the cultural landscape, such as the civil rights struggles and countercultural movements of the 1960s also meant that that they had largely petered out by the end of the 1970s. There were no nationally-prominent direct-action protests against highways in the United States as there were in the United Kingdom during the 1990s.

<table>
<thead>
<tr>
<th></th>
<th>Boston Globe (20)</th>
<th>Chicago Tribune (20)</th>
<th>Los Angeles Times (20)</th>
<th>New York Times (20)</th>
<th>Washington Post (20)</th>
<th>All Papers (100)</th>
</tr>
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<td>Accidents and safety concerns.</td>
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<td>0.15</td>
<td>0.1</td>
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<td>0.2</td>
<td>0.25</td>
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<td>0.3</td>
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<tr>
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<td>0.05</td>
<td>0.25</td>
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<td>Roads desperately need maintenance.</td>
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<td>0</td>
<td>0</td>
<td>0.07</td>
</tr>
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<td>Environmental or social impacts of highways.</td>
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<td>Air Pollution.</td>
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<td>0.05</td>
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<tr>
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<td>0.1</td>
<td>0</td>
<td>0.05</td>
</tr>
<tr>
<td>Concerns about energy efficiency.</td>
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<td>0.05</td>
<td>0.15</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>Trucks monopolizing or damaging roads.</td>
<td>0.05</td>
<td>0.1</td>
<td>0</td>
<td>0.05</td>
<td>0</td>
<td>0.04</td>
</tr>
<tr>
<td>Support for toll roads.</td>
<td>0</td>
<td>0.05</td>
<td>0.1</td>
<td>0.05</td>
<td>0</td>
<td>0.04</td>
</tr>
<tr>
<td>Promotion of an idyllic car-free lifestyle.</td>
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<td>0</td>
<td>0.1</td>
<td>0</td>
<td>0</td>
<td>0.03</td>
</tr>
<tr>
<td>New roads get filled with new traffic.</td>
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<td>0</td>
<td>0.1</td>
<td>0</td>
<td>0</td>
<td>0.03</td>
</tr>
<tr>
<td>Criticism of Detroit automakers.</td>
<td>0</td>
<td>0.1</td>
<td>0</td>
<td>0.05</td>
<td>0</td>
<td>0.03</td>
</tr>
<tr>
<td>Criticism of toll roads.</td>
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<td>0</td>
<td>0.15</td>
<td>0</td>
<td>0</td>
<td>0.03</td>
</tr>
<tr>
<td>The car culture is absurd.</td>
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<td>0.1</td>
<td>0.05</td>
<td>0</td>
<td>0.03</td>
</tr>
<tr>
<td>&quot;Carnage on the roads.&quot;</td>
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<td>0.1</td>
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<td>0.02</td>
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</tbody>
</table>

Table 5.11: The results of a quantitative content analysis of newspaper opinion articles about road transport from 1980 to 2001.

5.5.4. The Post-Incumbent American Railways

The Post-War Collapse, 1945-1959

As the railways became more marginal, complaints about monopolistic and untrustworthy railway managements faded to be replaced by a dominant negative story-line portraying the railways as obsolete and impractical. At the same time, however, two new positive story-lines emerged. One of these was nostalgic, portraying the railways as part of an older, simpler, and more pleasant transport system, and one which capitalized on perceived problems within the road regime, portraying the railways as a viable alternative to it.

Local communities who were angry about the cancellation of their local passenger rail service were the first group to express concerns about the collapse of American passenger railways, as correspondents in major newspapers complained about the cancellation of their
The evolution of discursive story-lines during socio-technical transitions

local commuter rail lines. Opinion columns and editorials noticed this as a national trend: One tenth of the articles surveyed in the quantitative analysis for the post-war period discussed the effects of railway cancellations, which included stranded commuters, harms to local economies and highway congestion. (Table 5.1) One correspondent in The New York Times argued that the railways had an obligation to maintain their old routes, regardless of their profitability: “There’s a profit in fifty tons of coal but not in fifty tons of businessmen and matrons. The coal, however, didn’t buy a house in West Nyack or Bethel believing that there would always be a 7:58 train. The commuter did.” Many of these articles indicate a position that the railways existed not just for commercial profit, but also to serve the key social function of providing people with basic transport.

The controversy over railway closures gave new life to the struggle that had existed in the previous periods between railway companies and their passengers. Railway Age, the most prominent railway journal from this period, defended the closure of railways, and ruled out any suggestion of subsidies to keep the railways afloat, describing it as anathema not just to the efficient running of a railway, but also to core American values. Railway Age demonstrates this attitude in its editorial treatment of commuter railways: “While it meets a real public necessity, its patrons are unwilling to pay enough to meet its costs of operation…regulators will have to allow fares high enough to pay costs or, as a dangerous alternative, tax monies will have to be used to make up the difference under some kind of public authority control”. Railway Age argued that “there is no choice but 100 per cent capitalism on the one hand and 100 per cent slavery to the state on the other. Any seeming half-way stage between the two is only an incident of transition.”


<table>
<thead>
<tr>
<th></th>
<th>Boston Globe (20)</th>
<th>Chicago Tribune (20)</th>
<th>Los Angeles Times (20)</th>
<th>New York Times (20)</th>
<th>Washington Post (20)</th>
<th>All Newspapers (100)</th>
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<td>Labour issues.</td>
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<td>0.55</td>
<td>0.32</td>
<td>0.40</td>
<td>0.25</td>
<td>0.35</td>
</tr>
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<td>Railways are unfairly regulated.</td>
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<td>0.05</td>
<td>0.37</td>
<td>0.00</td>
<td>0.15</td>
<td>0.11</td>
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<td>Closures of struggling railways.</td>
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<td>0.15</td>
<td>0.05</td>
<td>0.10</td>
<td>0.10</td>
<td>0.10</td>
</tr>
<tr>
<td>Accidents and safety concerns.</td>
<td>0.05</td>
<td>0.05</td>
<td>0.11</td>
<td>0.10</td>
<td>0.15</td>
<td>0.09</td>
</tr>
<tr>
<td>Praise of railway innovation or initiative.</td>
<td>0.05</td>
<td>0.25</td>
<td>0.00</td>
<td>0.05</td>
<td>0.10</td>
<td>0.09</td>
</tr>
<tr>
<td>Aviation is competing with railways on unfair terms.</td>
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<td>0.05</td>
<td>0.26</td>
<td>0.00</td>
<td>0.00</td>
<td>0.08</td>
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<tr>
<td>Railways portrayed as an older, simpler, or more pleasant form of transport.</td>
<td>0.05</td>
<td>0.05</td>
<td>0.11</td>
<td>0.05</td>
<td>0.05</td>
<td>0.06</td>
</tr>
<tr>
<td>Labour unions are inflating railway costs</td>
<td>0.00</td>
<td>0.15</td>
<td>0.11</td>
<td>0.05</td>
<td>0.00</td>
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<td>Railways are obsolete.</td>
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<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>Railway closures cause hardship for commuters.</td>
<td>0.10</td>
<td>0.00</td>
<td>0.11</td>
<td>0.00</td>
<td>0.00</td>
<td>0.04</td>
</tr>
<tr>
<td>Railways are good for the local economy.</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.10</td>
<td>0.04</td>
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<tr>
<td>Support for railway subsidies.</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td>Railways are incompetently or unimaginatively run.</td>
<td>0.00</td>
<td>0.00</td>
<td>0.11</td>
<td>0.00</td>
<td>0.10</td>
<td>0.04</td>
</tr>
<tr>
<td>Railways are in crisis.</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.10</td>
<td>0.00</td>
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<tr>
<td>Railways are run by greedy executives.</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.05</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Table 5.12: The results of a quantitative content analysis of newspaper opinion articles about railways from 1945 to 1960.

The growing perception of railways as an essential public infrastructure persisted throughout this period, and by the end of the 1950s, it was common to describe an expanded railway network as a solution to pollution, dangerous roads, urban blight caused
The evolution of discursive story-lines during socio-technical transitions by highways, or other problems of the road regime. A 1953 letter in the New York Times was made this case with particular vigour, demonstrating a very early use of a story-line portraying a country paved over by highways:

The importance of [railway development] is much greater in these days of highway saturation…. At the rates trucks and passenger cars are being built we never will have enough roads, and as we try to provide them we will find ourselves being devoured by a Frankenstein monster of our own creation.

Another positive story-line emerging during this period portrayed the railways as a nostalgic form of transport from a simpler time. A 1959 editorial in the New York Times, for example, lamented that with the railway closures “the American dream seems to be slipping into oblivion. For it was the passenger train that moved half a dozen generations of country boys to the big city and to the great things that could be done there. The trains were a spiritual as well as a physical escape”. The same year, a Chicago Tribune correspondent mourned the loss of leisurely travel in the dome car of a cross-country train. This was countered by a negative story-line portraying the railways as incompetently run or fundamentally obsolete, which accounted for 5 percent of the articles in the quantitative analysis. This low figure probably does not reflect the true popularity of that story-line, as commentators who saw the railways as obsolete and irrelevant would have been unlikely to spend very much time writing about them.

The Creation of Amtrak, 1960-1979

The quantitative analysis of newspaper articles about railways from between 1960 and 1979 shows a growing interest in the railways as a solution to the problems of pollution and road congestion (Table 5.1). Railways and transit became a niche political issue among upper-class liberals. In 1963, the National Association of Railroad Passengers was founded to represent the interests of passengers against cuts to the passenger network. Their correspondence in major newspapers from the late 1960s illustrates that story-lines portraying railways as a nostalgic and pleasant form of travel, or as a valuable alternative to

881 Patton 1986, p. 106.
the road regime, had become strategically valuable for actors supporting the railways. In 1968, one such letter argued that “There is no doubt that long distance trains can attract travellers who prefer the advantages of relaxation and an unexcelled view of the scenery.”

After it was founded in 1971, Amtrak executives also wrote frequent letters to the editors of newspapers promoting similar story-lines.

Newspaper coverage during the 1960s and 1970s increasingly adopted these pro-rail story-lines, portraying the railways as having the potential to fix many of the most vexing problems of the road regime, with eleven percent of the articles surveyed in the quantitative analysis portraying the railways as a promising alternative to the roads.

A similar story-line was adopted by Railway Age, which by the 1960s had abandoned its scepticism of subsidies to write favourably about several government schemes designed to encourage travel by rail and public transport.

One 1966 article told a fanciful story about how a motorist named Bob re-invented the railway by using his car to tow his neighbours’ cars along wooden slats. When this caught on nationwide the social benefits were obvious:

Bob was honoured by a big dinner in Washington. Mayor after mayor praised Bob to the skies for saving his city. ‘Our parks were turning into parking lots, our biggest buildings were garages, and our traffic was fast becoming motionless,’ was what they all said. ‘I just can’t see why nobody thought of the train and the rail-road before,’ said Bob’s modest reply. ‘It’s so logical. You don’t need all those drivers, you don’t need all those engines. You take up so little room—a rail-road is so narrow. And nothing, but nothing, moves along so easy as a steel wheel rolling on a steel rail. Think of all the savings!’

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The evolution of discursive story-lines during socio-technical transitions

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<td>The railways are safer than road transport.</td>
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Table 5.13: The results of a quantitative content analysis of newspaper opinion articles about railways from 1960 to 1979.

As story-line portraying railways as alternatives to the highways caught on, commentators began to support the idea of railway subsidies.887 This was made more palatable by an observation, present in twelve percent of the newspaper articles surveyed, that highways and airports were already heavily subsidized, implying that the railways should receive government support as well (Table 5.13).888 By 1965, newspaper articles and letters to the editor had noticed Japan’s new Shinkansen high-speed trains, and wondered why the United


States could not develop a similar system.\textsuperscript{889} The \textit{Boston Globe}'s explanation for this was an incompetent bureaucracy: "The Japanese proudly display their 150 m.p.h. Tokyo-Osaka express. Europeans enjoy superb rail service. Meanwhile, Washington fumbles—and the ICC acts in apparent non-coordination with other agencies".\textsuperscript{890} During the 1970s, as the Federal Government actually did begin subsidising passenger railways through the creation of Amtrak, story-lines supporting a subsidised railway system grew stronger.\textsuperscript{891} Environmentalism, increasing congestion, and the oil crisis further added to the demand for an improved rail network (Figure 5.29).\textsuperscript{892} One correspondent in \textit{The Boston Globe} noted that "when money is spent on improving rail passenger service it is called a ‘subsidy’, but when vastly larger amounts are lavished on the interstate highway system and airport and air traffic control systems, it is called ‘investment’."\textsuperscript{893} The editor of the \textit{New York Times} saw Amtrak subsidies as essential given the situation on the highways:

Highway congestion can be relieved only at the cost of expensive new construction programs that mar the landscape, dislocate homes and industries and carry new congestion and pollution into already strangling metropolitan areas. In the absence of radical new modes of transportation, which will take years to develop and install, improved rail service is the logical answer to the needs of medium-distance intercity travellers.\textsuperscript{894}

One correspondent in the \textit{Chicago Tribune} argued that "As the earth’s supply of fossil fuels grows ever smaller, automobiles as a primary source of transportation can no longer be justified."\textsuperscript{895}

\textsuperscript{893} Symmes, R.W., 1977, ‘Amtrak’s western trains are well patronized’, 4 October, p. 30.
The evolution of discursive story-lines during socio-technical transitions

Not all commentators were comfortable with railway subsidies, however, and opposition to Amtrak’s subsidies contributed to new negative story-lines about the railways. Eight percent of the articles about railways surveyed for the quantitative analysis from between 1960 and 1970 complain about Amtrak’s subsidy (Table 5.13), with critics often arguing that an obsolete transport system was a waste of federal tax dollars. A New York Times editorial complained that Amtrak would be simply a “bill-paying organisation” for railways run by the same “bungling rail managements that did more than either airlines or buses to drive away past passenger traffic.”

The Boston Globe took a similar line, as did many letters to the editor of various papers. Even some of Amtrak’s supporters, particularly in the Wall Street Journal, were still opposed to government subsidies, and demanded that Amtrak be put on a paying basis as soon as possible. During the late 1970s and 1980s, commentators used the increasingly popular free-market discourse to support cuts to Amtrak’s subsidy, while others argued that Amtrak was simply too expensive. This story-line presented railway travel as something that sounded nice, but that was financially impractical. One editorial in the Washington Post argued that “Despite their sentimental

appeal, these trains can no longer begin to approach financial self-sufficiency.”  

By the end of the 1970s, Amtrak’s opponents had begun to address arguments about fuel efficiency, arguing that Amtrak trains were not actually very fuel-efficient per passenger-mile due to their low occupancy, and therefore that Amtrak should focus on higher-density routes.

Support for a Rail Alternative, 1980-2001

Public support for railways grew during the 1980s. Newspapers were becoming optimistic about Amtrak, with 21 percent of articles considered for the quantitative survey praising Amtrak’s progress. The argument that rail subsidies should match road and airline subsidies also became very common (Table 5.1). Commentators gave enthusiastic coverage to new rail projects. The editor of the Los Angeles Times was particularly impressed by a planned suburban line to Orange County, arguing that “the new [rail] terminals offer an attractive alternative to the automobile.”

By the 1990s, railways were predominantly understood according to just a handful of well-worn story-lines (Figure 73). The first of these was a vision of rail transport as a solution to problems in the car system. This appeared even in traditionally conservative media outlets that had previously opposed Amtrak’s subsidy. The Washington Post, for example, argued in 1997 that subsidies for Amtrak were a good way to take pressure off the highways, noting that “In a field such as public transportation, the market solution is not always the right one.” A letter to the editor of the Wall Street Journal, complaining about Amtrak’s opponents, positioned Amtrak as “a public service that will become even more critical as overcrowded transportation corridors are further strangled by congestion and a deteriorating infrastructure.” This continued to be supported by the arguments that other forms of transport received subsidies, and therefore that railway subsidies are acceptable. A New York Times correspondent illustrated this view in 2000 with the remark that “all major forms of transportation in the United States depend on public money too. It’s just that intercity trains don’t get their fair share.”

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Another story-line portrayed the railways as a slower, more relaxing way to travel, compared to both the roads and the airlines (Figure 5.30). This appeared in 10 percent of the articles surveyed in the quantitative analysis during the 1980s and 1990s, and in over 20 percent of those in the Boston Globe and Washington Post (Table 5.14). These articles emphasize the aesthetic experience of train travel, and portray Amtrak’s flaws as endearing rather than frustrating.\(^{907}\) One correspondent in the Los Angeles Times recounted that each of his trips was “a unique and wonderful experience—breakdowns and delays included. Why? Because taking the train is an adventure.”\(^{908}\) Even Amtrak’s opponents began conceding this point, as the editor of the New York Times did in an article arguing for cuts to Amtrak subsidies, which noted that “Train travel is undeniably more romantic or fun”.\(^{909}\)

This story-line was somewhat offset, however, by a negative story-line emphasizing the deficiencies in Amtrak’s service. This frequently appeared in letters to the editor in which correspondents complained of nightmarish experiences on the railways.\(^{910}\) A letter to the editor of the Los Angeles Times provides a good example of these:

> Among other exciting events, we crashed into a truck that was crossing an intersection, observed a rather disconcerting diesel fuel spill, endured hordes of children running up and down the aisles (unsupervised) and then we actually ate an Amtrak hamburger. The full-steam ahead speed never exceeded a safe and sane 35 m.p.h. Following this experience, we purchased a new car and plan to ‘leave the driving to us’.\(^{911}\)

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<td>Amtrak is incompetently run.</td>
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Table 5.14: The results of a quantitative content analysis of newspaper opinion articles about railways from 1980 to 2001.

The last story-line called attention to what the Amtrak had accomplished since the 1970s. Commentators pointed to increased traffic on Amtrak, the improved rolling stock, and a generally improved travel experience as evidence that the Federal subsidy had been a good investment. A whole series of letters to the editor of The Washington Post made this case in 1994.912 One of these claimed this as a victory for Amtrak’s ridership as well as its

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The evolution of discursive story-lines during socio-technical transitions

management: “By riding modern trains where they exist, the U.S. Public is pushing its leaders toward the more balanced transportation policies that most other nations enjoy”.

American passenger railways, despite their marginality, had a range of positive story-lines associated with them by this point. The debate, however, had stagnated. Without a compelling story-line providing a systemic critique of the road regime, there was no impetus for a policy agenda aimed at providing an alternative. Railways had developed support based on nostalgia for the railways of the past, and on frustrations with the dominant road regime, but these were insufficient motivation for a major programme of government investment. The American railways never had a discursive breakthrough.

5.5.5. Conclusion

Positive story-lines about road transport during this period benefited from a combination of empirical credibility and narrative fidelity. Empirical credibility came from a widespread conviction that, partly because the railways were so weak, there was no viable alternative to road transport. This view was so strong that there was not even a vision of a transport system dominated by the railways, or any other alternative technology, much less any substantial moves to move towards such a vision. Narrative fidelity came from stable story-lines linking car travel with freedom and American nationalism, which were routinely used

913 Ibid.
in opposition to any suggestions for regulations on the motor regime, particularly during
the backlash of the 1980s. As the analytical model predicts, negative story-lines about the
motor regime gained experiential commensurability and empirical credibility from
problems such as congestion and pollution. This fits well with the analytical model, which
predicts that a reigning regime will enjoy a huge advantage in terms of empirical credibility,
but that pro-regime story-lines lose experiential commensurability due to unsolved
problems within the regime.

Because the experiences that this drew on were largely the experiences of motorists,
however, these story-lines rarely if ever implied that the car regime should be curbed in any
way. Instead, critics of the road transport regime proposed reforms that would improve
highway safety, fuel efficiency, or other elements of the regime that primarily affected
motorists themselves. This meant that even the road regime’s harshest critics did not
generate an anti-road protest movement, as they had in the United Kingdom.

Positive story-lines about the railways illustrate an interesting dynamic in the story-lines
attached to a post-incumbent regime. As train travel became a less common experience for
Americans, it became easier to idealize, either by placing the railways in nostalgic story-lines
about a simpler, more pleasant past, or by portraying them as an interesting, adventurous,
and more pleasant means of travel in the present, whose slowness and unreliability was an
asset rather than a liability. There are interesting parallels between this and the story-lines
used to describe radical niche innovations: While new technologies are projected into an
idealized future in order to obscure their present-day shortcomings, post-incumbent regime
technologies can be projected into an idealized past for the same reason. This further
illustrates the importance of open possibility-space for marginal technologies that have
limited empirical credibility: Because they are not commonplace, they can be the subject of
vague visions that have a wide appeal.

This effect facilitated positive story-lines about trains which enjoyed considerable
experiential commensurability. A different set of positive story-lines about trains,
portraying them as a more efficient and environmentally friendly mode of transport that
would ease congestion on the roads, gained empirical credibility from problems with the
road regime. Paradoxically, however, negative story-lines about the railways scored high on
exactly the same variables: A story-line portraying railways as obsolete gained empirical
credibility from the very obvious dominance of the car regime, while a story-line portraying
them as outdated and uncomfortable gained experiential commensurability from
newspaper correspondents’ stories about hellish railway journeys. These negative story-
The evolution of discursive story-lines during socio-technical transitions

lines had weakened somewhat by the 1990s, but ultimately, positive story-lines about railways were insufficient to motivate anything but reluctant Federal investments in them. This suggests that positive story-lines about alternative technologies are unlikely to have very much practical impact in the absence of corresponding negative story-lines about the dominant regime, which did not exist in this case.
5.6. Conclusions to the American Case Study

The American case study has several parallels with the British case study, and with the analytical model. There are, however, some important mismatches within each period, as well as a big mismatch between the temporality of the phases in the analytical model, and the progression of the periods in this case study. These points are discussed below.

**Period 1: Radical Novelty (1887-1910).** This period matches both the British case study and the analytical model. Cars were largely ignored by the incumbent railway regime. The railway regime enjoyed the support of story-lines relying primarily on empirical credibility, emphasizing the railways’ economic importance and engineering achievements. Past grievances against the railways’ business practices, however, saddled them with persistent negative story-lines portraying railway companies as abusive monopolies. This supports the analytical model’s proposition that incumbent regimes face negative story-lines drawing empirical credibility or experiential commensurability from problems within the regime. In response, American railway actors asserted their expertise, dismissing their critics as an uninformed mob. This reliance on actor credibility on the part of regime actors fits well with the analytical model.

Positive story-lines about cars portrayed them as inherently progressive, which violates the analytical model slightly, in that it uses a vague sense of technological optimism rather than any specific visions of the future, but it does support the proposition that niche story-lines benefit considerably from actor credibility. Negative story-lines about cars, meanwhile, were very similar to those of the British case, and emphasized the motor niche’s early problems, such as noise and accidents. This also fits well with the analytical model.

**Period 2: Stabilization (1910-1929)** The strategy adopted by American car advocates in their efforts to reform the street to better accommodate cars is very similar to the strategy adopted by British car advocates in their campaigns for improved trunk roads. In both cases, problems such as accidents and rural blight were mobilized to justify further accommodation of road vehicles. Both cases therefore exhibit the same mismatch with the analytical model, which suggests that niche proponents will highlight problems with the incumbent regime while advocating for accommodation measures. This suggests a modification to the analytical model which will be considered in chapter 6. Story-lines from railway advocates, meanwhile, emphasized the regulatory burden of rail transport
compared with that of road transport, rather than promoting the railways’ strengths compared to the roads. This suggests that the railways were already destabilised due to cultural and political challenges. The fact that this occurred before road transport had fully established itself as a regime in its own right violates the basic premise of the stabilisation phase, which assumes that it will occur while the incumbent regime remains relatively strong. The implications of this are discussed in greater detail below.

**Period 3: Contestation and Overthrow (1929-1945)** The importance of narrative fidelity during this period matches the analytical model, as advocates of both rail and road transport tried to match their story-lines with cultural landscape trends, such as the popular enthusiasm about technology. Beyond that, however, this period demonstrates an important mismatch with the analytical model, because there is little evidence of direct political confrontation between the proponents of road and rail transport. As with the previous period, the railways were in a very weak position, meaning that the ascendant road regime did not even bother to engage with them. This continues the mismatch found in period 2: The railways appear to be at a significant political disadvantage much earlier than is suggested by the model. Another interesting finding from this period is the discrepancy in popular story-lines between different kinds of actors. While journalists were often sympathetic, portraying the railways as the victims of unfair government regulation, many politicians were overtly hostile to them. This suggests that story-lines can be more or less important depending on the actors that subscribe to them.

**Period 4: Regime Maintenance (1945-2001).** This period fits well with the analytical model. After a brief period of enthusiasm as the interstate highways were built, the American road transport regime became mundane. Issues such as pollution, congestion, accidents, and urban decay gave negative story-lines about cars and highways considerable empirical credibility and experiential commensurability. Positive story-lines about the car regime remained strong, however, gaining narrative fidelity through their association with stable American narratives about freedom, and empirical credibility due to the total lack of a credible alternative. Negative story-lines about the road regime, meanwhile, mostly emphasised disparate problems, and only rarely developed the narrative fidelity to unify these into broader anti-road discourses. This might help explain why American anti-highway movements were more marginal, and did not support any
new policy agendas aimed at curbing car use in the United States. Railway story-lines, in keeping with the analytical model, portrayed the railways as a pleasant, nostalgic form of transport, or as a solution to the problems with the road transport regime.

The American case study fits well with both the British case study and the analytical model, while also suggesting some useful additions. One very important mismatch, however, takes place over periods 2 and 3, when railway story-lines were considerably weaker than the analytical model predicts. This meant that the essential nature of the struggles during these periods, as well as the participants in them, do not match the analytical model. This could be a unique outcome of the American case study, illustrating the importance of deeply-rooted critiques of the railways dating back from the antebellum era, or the influence of behind-the-scenes political struggles that the railways lost. Theodore Roosevelt and Woodrow Wilson’s proposals for an inland waterway system as an alternative to the railways before cars suggests that negative story-lines about the railways had created a demand for an alternative before such an alternative existed. Once an alternative did exist in the form of road transport, it gained support very quickly, and gave the railways very few opportunities to gain any support back. This idea is explored further in the next chapter, which considers the British and American case studies systematically in relation to each other and to the analytical model.
The evolution of discursive story-lines during socio-technical transitions
Chapter 6: Conclusion and Discussion

6.1. Introduction

This chapter evaluates how well the two observational patterns provided by the case studies match with the conceptual pattern outlined in chapter 2 to illustrate a valid empirical model. Section 6.2 systematically evaluates the twelve propositions introduced in section 2.5 in light of the evidence from the case studies to show which ones match and which ones require modification. Section 6.3 looks in detail at dynamics which were observed in the case studies but not predicted in the analytical model, and considers modifications to the model that can help account for these. Section 6.4 reflects on an important mismatch between the temporality of the four-phase model and the histories of the two case studies, proposing a re-orientation of the analytical model to account for this. The final three sections consider the implications of the analytical model. Section 6.5 evaluates the generalizability of the analytical model, particularly as it applies to sectors other than transport. Section 6.6 considers the implications of this research for present and future transitions. Finally, section 6.7 discusses some important limitations of this research and suggests some directions for further research.

6.2. Pattern Matching

Despite some mismatches, the analytical model has been largely successful in accounting for dynamics in each of the case studies. This is demonstrated in table 6.1, which evaluates each of the propositions from section 2.5 in light of the two case studies. Based on this table, this section will consider the validity of each of the theoretical propositions in detail.
<table>
<thead>
<tr>
<th>Proposition</th>
<th>British Case-Study</th>
<th>American Case-Study</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase 1: Radical Novelty</strong></td>
<td></td>
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<tr>
<td>Pro-niche story-lines emphasize the future rather than the present.</td>
<td><strong>Match.</strong> Visions of cars for “men of moderate means” were promoted as a way of avoiding class conflict.</td>
<td><strong>Match.</strong> Cars were depicted as progressive, and were expected to play an important role in future transport.</td>
</tr>
<tr>
<td>Regime actors assert their expertise to challenge negative story-lines generated in previous and ongoing struggles.</td>
<td><strong>Match.</strong> Anti-railway story-lines blamed bad service on amalgamation. Railway magazines dismissed critics as uninformed.</td>
<td><strong>Match.</strong> Populist story-lines portrayed railways as a threat to democracy. Railway magazines dismissed critics as uninformed.</td>
</tr>
<tr>
<td>Story-lines challenging the niche technology’s legitimacy cast it as unproven, as dangerous, or as a nuisance.</td>
<td><strong>Match.</strong> Cars were condemned as dangerous nuisances.</td>
<td><strong>Match.</strong> Cars were seen as a pipe dream, or as a dangerous nuisance.</td>
</tr>
<tr>
<td><strong>Phase 2: Stabilization</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Story-lines advocating accommodation of the niche technology cast it as a solution for problems in the regime.</td>
<td><strong>Mismatch.</strong> Car advocates argued that new roads would address problems caused by cars.</td>
<td><strong>Mismatch.</strong> Road construction and jaywalking laws were promoted as solutions to a wide range of social ills.</td>
</tr>
<tr>
<td>Anti-niche story-lines emphasize its unintended consequences or social frictions.</td>
<td><strong>Match.</strong> Newspapers and politicians expressed alarm over road accidents and rural blight.</td>
<td><strong>Match.</strong> Correspondents to newspapers complained about car accidents and congestion.</td>
</tr>
<tr>
<td>Pro-regime story-lines cast the regime as a mature system, free of the problems plaguing the niche technology.</td>
<td><strong>Match.</strong> Railway journals emphasized the better safety record of the railways compared with motor transport.</td>
<td><strong>Mismatch.</strong> American railway supporters emphasized their regulatory disadvantage compared with road transport.</td>
</tr>
<tr>
<td><strong>Phase 3: Contestation and Overthrow</strong></td>
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<td></td>
</tr>
<tr>
<td>Story-lines about the challenger regime connect it with a new kind of society, which is presented in utopian or dystopian terms.</td>
<td><strong>Match.</strong> British motorway proponents talked enthusiastically about a coming “motor age”.</td>
<td><strong>Match.</strong> The 1939 World’s Fair exhibition, as well as some newspapers, presented a vision of a futuristic, motorized United States.</td>
</tr>
<tr>
<td>Pro-incumbent story-lines emphasize renewal of the regime through incremental innovations.</td>
<td><strong>Match.</strong> The railway modernisation programme was promoted as a way of creating a new, modernized railway.</td>
<td><strong>Match.</strong> American railways used streamliner trains as a promotional device.</td>
</tr>
<tr>
<td>Anti-incumbent story-lines condemn the incumbent regime as an obsolete relic.</td>
<td><strong>Match.</strong> Railways were condemned as “Victorian” or “Nineteenth-Century”.</td>
<td><strong>Mismatch.</strong> Railways were condemned for their failure to innovate, and for their and past abuses.</td>
</tr>
<tr>
<td><strong>Phase 4: Regime Maintenance</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pro-Regime story-lines become increasingly stable, making use of time-honoured tropes.</td>
<td><strong>Mismatch.</strong> Car regime actors adjusted their story-lines to adapt to environmentalism.</td>
<td><strong>Match.</strong> Cars were reliably depicted as emblems of freedom, and as necessities.</td>
</tr>
<tr>
<td>Negative story-lines stabilize around perceived problems with the new regime.</td>
<td><strong>Match.</strong> Anti-motorway activists described roads as a threat to the country.</td>
<td><strong>Partial Match.</strong> Critics of the road regime emphasized its problems for drivers.</td>
</tr>
<tr>
<td>Story-lines in favour of the post-incumbent regime, if it still exists, are nostalgic.</td>
<td><strong>Partial Match.</strong> Trains were seen as an alternative to the roads, but were sometimes discussed in nostalgic terms.</td>
<td><strong>Match.</strong> Trains were cast as appealing relics of a simpler time, but were also seen as an alternative to the roads.</td>
</tr>
</tbody>
</table>

Table 6.1: Detailed evaluation of the analytical model in light of the two case studies.
6.2.1. Phase 1: Radical Novelty

*United Kingdom: 1896-1918, United States: 1887-1910*

**Proposition 1.1: Pro-niche story-lines emphasize the future rather than the present.**

On a superficial level, predictions of future motorways in the United Kingdom, as well as the dismissal of early American car critics as “fogey’s”, match this proposition well. In the United Kingdom, story-lines about affordable cars were used strategically to protect the legitimacy of motor vehicles from negative story-lines based in class conflict. Positive story-lines about early American cars do not match this proposition quite as well as their British counterparts, because their portrayal of cars as emblems of progress was often vague, not necessarily invoking specific visions of the future. It is possible that the general climate of technological optimism prevailing in the United States during this period meant that positive story-lines about cars could afford to be less specific.

The deeper logic behind this proposition is that niche actors can nimbly craft story-lines which respond to the cultural landscape. This appears to hold in both cases. The open possibility space associated with cars allowed their proponents in both countries to be very vague, which made it easier for them to link their story-lines with the cultural landscape. This demonstrates the importance of narrative fidelity as a discursive resource for niche story-lines during the radical novelty phase.

**Proposition 1.2: Regime actors will assert their expertise to challenge negative story-lines generated in previous and ongoing struggles.**

The British and American cases both match this proposition. In the United Kingdom, a popular story-line blamed poor service and high fares on amalgamation and the resultant lack of competition. In the United States, similar story-lines were strengthened by populist landscape discourses that portrayed amalgamated railway companies as a group who used their unchecked power to undermine American democracy. British and American railway magazines adopted similar messaging in response to these story-lines, condemning railway critics as ill-informed. This demonstrates the importance of empirical credibility and actor credibility as discursive resources for incumbent regime actors.
Proposition 1.3: Story-lines challenging the niche technology’s legitimacy cast it as unproven, as dangerous, or as a nuisance.

In both countries, anti-car story-lines gained experiential commensurability from problems caused by cars, such as scared horses, noise, and accidents. The limited empirical credibility of cars also played a role, as establishment figures ridiculed proposals that cars might play a role as a utilitarian means of transport. The fact that these anti-car story-lines disappeared very quickly in the United States once inexpensive cars such as the Model T began to be used by farmers illustrates the connection between these kinds of story-lines and a niche innovation’s lack of empirical credibility. As the practical utility of cars became more visible, threats to their legitimacy became weaker.

6.2.2. Phase 2: Stabilization

United Kingdom: 1918-1945, United States: 1910-1929

Proposition 2.1: Story-lines advocating accommodation of the niche technology cast it as a solution for problems in the incumbent regime.

There is some evidence for this proposition in both case studies, most notably in the discussions of buses as ways to escape the abuses of the railways. Most story-lines justifying accommodation measures such as improved road construction or new traffic laws, however, made no mention of the rail regime. Instead, they referenced problems such as accidents, congestion, and rural blight; many of which were themselves caused by the growing popularity of cars. This is an important and consistent mismatch with the analytical model.

This proposition is based on the logic that the increasing empirical credibility of the niche technology during this phase would position it as a viable solution to long-standing perceived problems within the regime. The analytical model assumes that niche actors attempt to take advantage of this as they argue for changes in policies, infrastructures, and social practices to accommodate the niche technology. In the case studies, motor niche actors did take advantage of the demand for solutions to pervasive transport problems to advocate for accommodation measures. The problems being solved, however, were not restricted to those caused by the rail regime. This suggests that niche actors can be more flexible and innovative with their story-lines during this period than was originally thought, and could
conceivably justify accommodation based on problems with the regime, problems with the niche, or problems with wider society. This will be considered in more detail in section 6.3.2. This proposition can be rewritten as follows:

**Proposition 2.1b:** Niche actors promote story-lines predicting societal improvements that will result from greater accommodation of the niche technology.

**Proposition 2.2:** Anti-niche story-lines emphasize its unintended consequences or social frictions.

In both case studies, the increasing accident rate during the 1920s, as well as mounting impositions on pedestrians and the countryside, led to a public outcry against cars. In the United Kingdom, this led to dramatic newspaper coverage of motor accidents, while American cities saw well-funded public relations campaigns aimed at curbing the impact of cars on urban environments. In both countries, these story-lines benefited from experiential commensurability and empirical credibility due to widespread awareness of the consequences of more cars on the roads. This reflects the logic underlying this proposition: An expanding niche innovation that has not yet been strongly embedded into its societal context will generate acutely-felt social frictions.

**Proposition 2.3:** Pro-regime story-lines cast the regime as a mature system, free of the problems plaguing the niche technology.

During this phase, railway actors in both countries stopped seeing motor transport as a mere addition to their own system, and started seeing it as a threat. In the United Kingdom, their response was to attack the empirical credibility of the story-line that motor transport was a viable replacement for the railways, by calling attention to problems on the roads; most notably that of accidents. In the United States, however, this was only a marginal perspective in railway journals, whose editors instead emphasized the regulatory differences between road and rail transport. This could be because the American railway regime was already struggling by this point, and so story-lines portraying it as naturally superior to the roads would have had lower empirical credibility. It should also be noted that in both countries, these story-lines were marginal, and were rarely seen outside of railway magazines. This proposition is therefore weakly supported by the match
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with the British case study, but will need to be supported by further empirical evidence before it can be said to be more generally valid.

6.2.3. Phase 3: Contestation and Overthrow

United Kingdom: 1945-1963, United States: 1929-1945

Proposition 3.1: Story-lines about the challenger regime connect it with a new kind of society, which is presented in utopian or dystopian terms.

In both countries, new roads were seen as an essential element of a new era of modern transport. Calls in the British press of the 1950s for the Ministry of Transport to adapt to a coming ‘motor age’ by building motorways are very similar to the vision of a motorized United States presented at the Futurama exhibition in 1939. In each case, visions of the future motor age were overwhelmingly positive, with a notable absence of the dystopian story-lines that are predicted in the analytical model. Whether this suggests that niche actors have a stronger discursive advantage in this phase than was originally supposed, or whether this is just a quirk of the history of passenger transport that does not appear in other transitions, will have to be settled with further research.

In the United States, these utopian visions were supported by a more pragmatic demand for unemployment relief. While this demand was not a vision of a new kind of society, it was still very closely connected to depression-era developments in the cultural landscape. This suggests that it still supports the underlying logic of the proposition, that narrative fidelity plays a big role during the third phase. The proposition should nevertheless be modified to better account for different kinds of story-lines that don’t fall into the categories of utopia or dystopia:

Proposition 3.1a: Positive and negative story-lines about the challenger regime give it a central role in large-scale societal crises or transformations.

Proposition 3.2: Pro-incumbent story-lines emphasize renewal of the regime through incremental innovations.

This proposition matches the case studies well. While incremental innovations in the railway sector received little public attention in either country prior to the 1930s, positive story-lines about the railways in both countries emphasized new
railway technologies when motor transport was threatening to overthrow the rail regime. It is possible that this is simply an artefact of the technical history of railways, with faster diesel and electric trains appearing at just the right moment to be used in this way. The fact that earlier innovations, particularly in electric railways, received much less publicity, however, suggests that these story-lines illustrate a discursive sailing ship effect, in which the incumbent regime publicizes big changes in order to build support for its struggle against the challenger regime. This is therefore a plausible match for the analytical model, which demonstrates the importance of narrative fidelity for the incumbent regime during this phase, as incumbent regime actors attempt to develop positive story-lines conforming with the cultural landscape.

**Proposition 3.3: Anti-incumbent story-lines condemn the incumbent regime as an obsolete relic.**

This proposition matches the British case better than the American case. In the British case, the condemnation of the railways as a Victorian relic was very explicit in newspapers and in books such as *The Twilight of the Railways*. In the American context, a story-line emerged saying that the railway managers had failed to innovate and meet the challenge of motor competition, but this story-line was less decisive than long-standing populist complaints against the railways’ business practices.

This could be explained by the fact that in the American case, the railways were culturally eroded, being the subject of negative story-lines going back as far as the populist era. This created a deep distrust of railway actors, particularly among policymakers, and meant that in the American case, narrative fidelity was not a crucial deciding factor as the analytical model predicts. Instead, the railways’ opponents pointed to more concrete issues, such as the threat of monopolistic “railroad bills”, rather than relying on a vague assertion that the railways belonged in a different century. This proposition should therefore be rewritten to account for pre-existing negative story-lines which might be more powerful than new ones developed during the contestation period:

**Proposition 3.3b: New anti-incumbent story-lines condemn the regime as an obsolete relic.**
6.2.4. Phase 4: Regime Maintenance

*United Kingdom: 1963-2003, United States: 1945-2001*

**Proposition 4.1:** Pro-Regime story-lines will become increasingly stable, making use of time-honoured tropes.

Deeply-rooted positive story-lines were only one part of regime actors’ storytelling efforts during this phase. Story-lines emphasizing notions of freedom and masculinity dating back to the earliest history of the automobile can be observed in both countries, but occurred mainly in car magazines and were more common in the United States, where cultural narratives about freedom were very conducive to positive portrayals of cars. In some cases, most notably during the fuel crisis of the 1970s, car regime actors were far more flexible with their story-lines than this proposition suggests, responding to problems such as the fuel crisis and new landscape discourses such as environmentalism by promoting radical innovations within the regime, such as electric vehicles and new kinds of mass transit. While it is not guaranteed that these story-lines will be successful, and indeed most car magazines in both countries gave up on stories about green vehicles by the 2000s, they should figure more prominently in the analytical model. This will be discussed further in section 6.3.1. While this proposition has some support, it does not account for the full range of incumbent regime story-lines during the fourth period, and can therefore be rewritten as follows:

**Proposition 4.1b:** Stable pro-regime story-lines will emerge that make use of time-honoured tropes.

**Proposition 4.2:** Negative story-lines stabilize around perceived problems with the new regime.

In both countries, a range of new problems with the car regime gained attention as hype over new road infrastructure subsided. This did not always result in stable anti-car story-lines, however. In both the United Kingdom and the United States, problems with the car regime, such as fuel crises, accidents, and air pollution, were well-embedded into the public consciousness by the end of the 1970s. It was only in the United Kingdom, however, that these coalesced into a durable and compelling story-line about a green and pleasant land being swallowed up by an insatiable concrete monster. In the United States, negative story-lines about cars
were less monolithic, and focused instead on specific issues such as town planning or the safety record of car companies.

The best explanation for this is that in the United Kingdom, the cultural landscape was more protective of the countryside and of the integrity of towns and cities than it was in the United States. This added the critical element of narrative fidelity to anti-car story-lines, which made them far more resonant, as will be discussed in section 6.2.5. What is clear in both countries, however, is that once the open possibility space afforded to a new technology, such as cars or motorways, collapses—an occurrence that is inevitable once it becomes a stable regime—complaints about it will become more forceful, as it can no longer be projected into the future. This proposition therefore partially matches the case-studies: Negative story-lines about the regime technology emerge after a transition, and they can be assembled into durable anti-regime story-lines. It is not necessarily the case, however, that they will. This proposition can therefore be rewritten as follows:

Proposition 4.2b: Negative story-lines about the regime will develop around persistent problems with it, and will become more forceful if they can be made to fit with the cultural landscape.

Proposition 4.3: Story-lines in favour of the post-incumbent regime, if it still exists, are nostalgic.

This is more pronounced in the American case, where railways became synonymous with slow, relaxing and pleasantly antiquated leisure travel. In the United Kingdom, trains remained viable enough that story-lines about them were more utilitarian. In both countries, however, the defunct railways saw a re-opening of their possibility space once they became a defunct regime. This was likely due to the fact that long-standing complaints about the railways lost experiential commensurability as travellers became less familiar with them. Even when knowledge of problems with the railways did exist, as it did in some of the continuing complaints about railway service quality in the United States, it could be attributed to the railways’ marginal status, rather than to any intrinsic quality of the railways as a technology. This made it easier to tell positive stories about past and future railways, just as it was easier to tell positive stories about future highways before any highways were actually built.
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This proposition is therefore supported in the case-studies, although it does not take into account the extent to which a defunct regime could be projected into the future as well as the past. Nostalgia appears to be a powerful preserver of defunct regimes, making an old system difficult to eliminate entirely. Having been preserved in this way, a defunct regime has essentially returned to niche status, with strong narrative arguments embedded in visions of both the past and future used to protect it from direct competition with the regime that replaced it. Given the right opportunity, such as widespread perceived problems in the incumbent regime, a defunct regime could move from this position back to a position of importance, just as a radical innovation can move from a marginal position to become an incumbent regime in its own right.

6.2.5. The Role of the Cultural Landscape

In both cases, the cultural landscape shaped story-lines at both the niche and regime levels. Differences between the story-lines observed in different countries and different historical periods can be ascribed to differences in the cultural repertoires that were available to actors crafting these story-lines. This section discusses how the cultural landscape influenced the content of the story-lines observed in each case study.

Phase 1: Radical Novelty

This period illustrates the value of the cultural landscape as a way for niche actors to compensate for their limited credibility. In the United States, actors supporting the motor regime associated cars with an enthusiasm for technological progress. In the United Kingdom, Edwardian class conflict made cars look like a hazard and a nuisance that the wealthy inflicted on the poor. Actors within the British motor niche responded nimbly to this by promoting visions of future cars that would be affordable to the middle and lower classes. This illustrates the considerable flexibility that niche actors have in responding to the cultural landscape. Because the implications of a niche technology are not yet fully understood, niche actors are free to speculate in a way that makes the niche technology look more appealing in light of the cultural landscape.

In the American case, the first period also demonstrates how the cultural landscape can threaten an incumbent regime. Populist and anti-trust attitudes strengthened anti-railway story-lines in the United States at the turn of the century. By emphasizing their technological triumphs, railways were somewhat successful in
associating themselves with the period’s enthusiasm for technology, but this did not sufficiently compensate for the narrative fidelity of anti-railway story-lines.

**Phase 2: Stabilization**

This period illustrates an important difference between British and American cultural landscapes, relating to how they perceive the countryside. In the United Kingdom, where the countryside was perceived as a timeless store of British values, increasing numbers of cars on rural roads were perceived as a threat. As a result, actors in the motor niche promoted story-lines arguing for new improved roads on the grounds that they would preserve the countryside by directing traffic away from towns and villages. In the United States, the countryside was perceived as an endless wilderness to be civilized. Pro-road story-lines in the United States therefore emphasized the value of new roads in civilizing the country-side, which was more in tune with the American cultural landscape.

**Phase 3: Contestation and Overthrow**

The analytical model predicts that the cultural landscape has the greatest influence during this period, due to the strategic of narrative fidelity in a discursive struggle between two equally viable regimes. This is supported by the case studies. In each case, the supporters of highways portrayed them as an exciting, modern development. Interestingly, however, this occurred during different decades in each case. In the United States, modernist visions of future roads were popular during the late 1930s, due to the enthusiasm for technocracy that existed during that period. In the United Kingdom, similar visions appeared in the context of post-war reconstruction, and were informed by the technological optimism of the 1951 Festival of Britain. This suggests that big infrastructural changes become more politically viable during periods where the cultural landscape is sympathetic to the idea of radical technological change.

**Phase 4: Regime Maintenance**

In both cases during this phase, the cultural landscape shifted away from its enthusiasm over technological progress, leading to concerns about the effects of highway infrastructure. These concerns became far stronger in the United Kingdom, possibly due to the greater cultural resonance of story-lines about preserving the countryside. It would be difficult to imagine road protesters being as successful in the United States they were in the United Kingdom, because the
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The fact that the content of the cultural landscape can have an important role in determining the content of story-lines is most evident in the two countries’ different views of the rural landscape. In the United Kingdom, particularly during the inter-war period, the natural landscape was seen as a national treasure to be protected and preserved in its ancestral state. Even at the 1951 Festival of Britain, in many ways the peak of British high modernism, much of the artwork celebrated the British landscape as an ancient part of the country. Story-lines supporting the expansion of road infrastructure in the United Kingdom therefore had to negotiate concerns about the integrity of the countryside; a challenge which they met more effectively in the 1920s and 1930s than they did in the 1970s and 1990s. The more utilitarian view of the countryside predominant in the United States meant that road projects did not face this obstacle.

Despite differences in the content of story-lines in the United States and the United Kingdom, many of them had very similar implications. In the 1920s and 1930s, for example, whether the goal was to ostensibly preserve the countryside or civilize the wilderness, story-lines promoted by actors in the road transport niche nevertheless supported the construction of new roads. This suggests that niche actors can be quite adept at creating a story-line to serve their interests, regardless of the cultural context they find themselves in. This might be more difficult for regime actors, however, who are more constrained by widely-acknowledged facts about the regime.

6.3. New Insights

This section discusses in detail three observations from the case studies that are not anticipated in the analytical model. Despite their mismatch with the model, however, these fit with its general assumptions, and can therefore be used to enrich it. Future research in the area of discourse in transitions should consciously look for the dynamics discussed in this section, to see if they can be observed more generally.

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6.3.1. The Use of Visions by Regime Actors

Speculation in car magazines about electric cars or futuristic mass transit systems illustrates that regime actors can use incremental technological developments strategically as a way of defusing criticism. While electric cars and monorails can be understood as radical technologies, and were certainly portrayed as such in car magazines, they were incremental in the sense that they did not threaten the essential structure of the car regime. Had they been implemented in the way that magazines proposed, they would have preserved individual vehicles driving on highways as the primary means of transport, while also dealing with some problems in the car regime.

The use of these innovations in story-lines promoted by motor transport actors in the 1970s is interesting, because it constitutes a use of visions by actors supporting a stable regime; something that the analytical model suggests should not happen. This can be explained by the fact that while the 1970s motor transport regime did not have the open possibility space necessary to project itself into an imagined future, some incremental innovations within the regime did. By co-opting story-lines about these innovations, motor regime actors were able to respond to complaints about their system. This is closely paralleled by railway regime actors in the United Kingdom, who portrayed motor transport as a useful adjunct to the railways, rather than as a means of transport in its own right. This shows that new innovations within a regime can be used regime actors to create visions of the future, allowing them to gain some of the discursive advantages normally enjoyed by niche actors.

6.3.2. Societal Mismatches and Fit-Stretch Dynamics

In both the American and British case studies, the story-lines promoted to justify the societal embedding of road transport traded on problems which had been caused by motor vehicles themselves, as discussed in section 6.2.2. This reveals an interesting way in which fit-stretch dynamics are interpreted in story-lines about a growing niche. A niche technology cannot fit and conform with its social context indefinitely: If it grows big enough, mismatches between the technology and its context will cause problems, which necessitate some stretching and transforming of the context. The analytical model assumed that story-lines justifying this would position the niche innovation as the solution to problems with the dominant regime, in order to take advantage of popular frustrations with it. While this did occur to some extent, it was far more common for proponents of motor transport to base their story-lines on problems such as accidents and rural blight, which were caused by the mismatches between cars and their social context.
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The analytical model was therefore correct in predicting that embedding measures would hinge on the popular perception of social problems, but it overlooked the fact that these problems could be caused by the niche technology itself. This is interesting because it reveals an element of circular causality at work during the stabilization phase: A niche technology grows to the point where it can no longer fit in easily with an unaltered social context, and this causes frictions. These frictions can in turn be used in story-lines promoting social changes to better accommodate the new technology. These changes then facilitate further growth of the niche technology, potentially establishing it as a challenger regime. If this dynamic appears in other case studies, it might suggest that niche actors have a clear and effective strategy available to them during struggles over embedding.

6.3.3. The Muscularity of Story-Lines

By ‘muscularity’, this section refers to the ability of story-lines to influence other elements of a transition. The analytical model of this thesis was intentionally agnostic on this question, and sought instead to trace the development of the story-lines themselves. Based on the case-studies, however, the development of story-lines can be shown to have had a concrete effect on the transition from rail to road in both the United Kingdom and the United States. There are a few instances in the case studies which illustrate this. These are listed below:

Untrustworthy railways in the United States: By the turn of the twentieth century, populists, progressives and their allies had created a durable anti-railway story-line, portraying the railways as being run by monopolists who used their commercial power to undemocratically impose a de-facto tax on the people of the country. This provided political cover for aggressive railway regulations, and made it much more difficult for the railways to lessen the burden of these regulations as they faced increasing pressure from motor transport. This gave the road regime a commercial advantage during the contestation and overthrow period.

Antiquated railways in the United Kingdom: The overthrow of the rail regime to produce a new motor transport regime culminated in 1963 when Richard Beeching announced major cutbacks to the railways in order to make the network profitable, when during the previous year the government was announcing continued financial support for motorway construction. Prevailing story-lines portraying road transport as emblematic of a new and exciting ‘motor age’, and condemning the railways as a relic of the Victorian past, made it more politically acceptable to cut railways and invest in motorways than vice-versa.
Concerns about the costs of railway modernisation were strengthened by the view that the railways were antiquated, as evidenced by the fact that no similar objections were raised over the cost of motorway construction. This discrepancy in the prevalent story-lines about road and rail transport facilitated the overthrow of the rail regime.

The threat of the motorways in the United Kingdom: Of the two countries studied, it was only in the United Kingdom that concerns about road transport were mobilized into policy agendas that challenged the road regime. This discrepancy could be explained by reference to the much stronger anti-car story-lines that developed in the United Kingdom, partly due to different cultural landscape influences in that context. Protests and policies aimed at curtailing car use were more justifiable under British story-lines, which emphasized concerns about the integrity of cities and the countryside, than under American ones, which mainly emphasized the consequences of the car regime for drivers. British anti-car story-lines created durable anti-car discourse coalitions, who were motivated to engage in or support militant protest actions. The long-term impact of these protests and the story-lines supporting them is debatable, but they do appear to have set political agendas regarding transport, potentially creating the opportunity for a policy shift away from cars.

In each of these examples, there were forces at work besides discourse. If a regime is well-supported by technological, financial, and policy advantages, then even the strongest anti-regime story-lines are unlikely to have an important impact. In crucial moments of contestation, however, the right story-line could tip the scales one way or another.

6.4. Reassessment of the Analytical model

The pattern matching exercise presented in section 6.2 suggests that the analytical model fits well with the two case studies. The mismatches between the framework and the case studies mostly fall into a predictable pattern, in which the story-lines predicted by the analytical model are present in the case studies, but are overshadowed by different story-lines that the conceptual perspective does not anticipate. This suggests that the analytical model can be improved by adding new dynamics to it, some of which have been discussed in section 6.2.

In one respect, however, the case studies violate a basic temporal assumption of the analytical model, namely that the four phases are discrete temporal periods. Instead, they seem to overlap considerably. In the American case, car proponents were advocating new road construction as early as 1902, while the interstate highways were not built until well
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after the railway regime had already collapsed. In the British case, the 1937 Square Deal Campaign is similar to the American railways' failed struggle for a level playing field with road transport, but occurs within the embedding phase rather than the overthrow phase. This suggests that the phases of the analytical model should not be thought of as discrete and mutually-exclusive periods of time, but instead as separate struggles which fall into a rough sequence, but which can overlap.

In a technological substitution pathway,\textsuperscript{915} which describes both the British and American case studies, the multi-level perspective predicts a gradual development of a niche-innovation from marginal experimental niches to market niches. This puts it in a position to overthrow the dominant regime once the regime has been destabilised by a landscape event. This pattern was assumed in the analytical model, particularly in the account of the third phase, whose reliance on policy paradigm shifts was based on an assumption that the collapse of the incumbent regime's credibility and policy support would follow the establishment of the challenger regime as a viable competitor. This informed the assumption that this phase would entail a major discursive conflict between the niche and regime technologies. In the United States, however, the railways, rather than the roads, were the ones proposing changes to dominant policy paradigms, as they attempted to level the regulatory playing field. They had a difficult time doing this, as the same popular story-lines about the railways which had supported the regulations in the first place continually condemned the railways as dangerous and abusive. Road transport supporters often did not even bother seriously addressing the railways' struggle. The American rail regime was already so badly weakened by the time road transport emerged as seriously viable competition that the supporters of road transport often did not even acknowledge it.

This suggests that in the American case, the discursive destabilisation of the rail regime occurred much earlier than the third period. Attempts by figures such as Woodrow Wilson and Theodore Roosevelt to develop alternative transport systems relying on waterways before such an alternative could plausibly be said to exist on the roads is evidence of a desire to move away from rail transport from a very early date. This contradicts Pesch's view that regimes can benefit from stable story-lines.\textsuperscript{916} In the case of the American railways, the stability of dominant story-lines appears to have been a liability rather than an asset. This makes story-lines a unique element of a regime: Like other things contributing to the regime, such as finances, technology, and user practices, story-lines are dynamically

\textsuperscript{915} Geels and Schot, 2007
\textsuperscript{916} Pesch 2014
stable. The stability of story-lines, however, does not necessarily contribute to the stability of the regime more generally, and may in fact undermine it. Negative story-lines could therefore be imagined as a potential negative feedback effect which develops as a regime expands.

This suggests that the transition process described in the analytical model should be broken up into two separate processes: The establishment of support for a viable challenger regime, and the erosion of the incumbent regime's legitimacy. These two processes appear to be much more loosely coupled than the analytical model originally assumed: A regime can be delegitimated for decades before a viable niche-innovation challenges it. The discursive destabilisation of the regime occurs on its own timeline, which might be influenced by the growing importance of a competing niche-innovation, but also might be influenced by developments within the regime itself, or at the landscape level. This implies that regime maintenance is a high-stakes game for regime actors, regardless of whether a competitive niche innovation exists. Negative story-lines about a regime are unlikely to pose a serious threat to its stability, as shown by the fact that American railways weathered the populist era very well. A negative story-line, however, could compound other events which destabilise the regime, as they did in the American case once the roads emerged as a serious alternative to the railways.

This suggests a re-thinking of the temporality of the analytical model. Instead of discrete periods of time, the four phases can be re-imagined as separate struggles involving niche and regime technologies which influence each other, but which do not necessarily occur in a neat and tidy progression. These struggles can be imagined as follows:

**Struggle 1: Legitimation.** In order to have enough support to develop further, a niche-innovation must be perceived as practical, functional, and as fitting into its societal context. Niche actors therefore attempt to build legitimacy, taking advantage of their discursive flexibility to associate their technology with the cultural landscape. Opponents of the niche-innovation will promote negative story-lines portraying it as impractical, as dangerous, or as a nuisance.

**Struggle 2: Stabilization.** To become a viable replacement for the dominant regime, a niche innovation must develop its own dedicated infrastructures, policies, user practices, cultural associations, and financial arrangements. In developing these accommodation measures, niche actors must argue for broad societal changes. They do this by positioning these changes as solutions to widespread societal problems, including those caused by the niche technology itself. Those who are
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inconvenienced by the expansion of the niche technology, or by the changes proposed by niche actors, will argue against these changes. This struggle is easier for niche actors to win if their technology is already perceived as legitimate, but ambitious niche actors might begin arguing for accommodation measures before they have won the first struggle.

**Struggle 3: Contestation and Overthrow.** This is a struggle between actors supporting the challenger and incumbent regimes over which of the two of them deserves the allegiance of key societal institutions, such as those that govern regulation and infrastructure. It is most likely to occur once a niche-innovation has already been embedded enough to constitute a regime in its own right. Once a viable challenger regime exists, however, it might have a major advantage if the incumbent regime has already been destabilised.

**Struggle 4: Regime Maintenance.** This struggle takes place on a different timeline from the other three struggles. It constitutes the efforts of regime actors to promote positive story-lines in the face of negative story-lines generated by problems or with the incumbent regime. These negative story-lines can be made more credible by the presence of a viable alternative, so regime maintenance becomes more difficult as a competing niche innovation moves through the three struggles discussed above. It is not necessary, however, for there to be such a viable challenger in order for regime actors to lose this struggle, and in fact they might do so while still remaining the dominant technology. If this happens, then the regime could remain stable, but be very vulnerable to challenges at the niche or landscape level.

Each of these struggles corresponds roughly to a phase of the analytical model, and includes story-lines similar to those discussed in the analytical model. Unlike the phases of the model presented in chapter 2, however, these struggles do not have to occur in the order presented. For example, while it is easier for niche actors to argue for embedding if they have already established their legitimacy, they might be more ambitious and begin arguing for accommodation measures before the legitimation struggle is fully complete. This accounts for the fact that some of the developments in the American case study appear to occur prematurely.

This modification accounts for lack of direct contestation between road and rail actors during the third phase of the American case-study. In the United States, the railways’
opponents had created durable anti-railway story-lines which popularised the idea that if
the country could move away from dependence on the railways, it should. This partially fits
with the de-alignment and realignment transition pattern. The American railway regime
was not entirely de-aligned due to negative story-lines about it, but it is possible for just one
or two elements of a regime to collapse while leaving the others relatively stable. The
cultural element of the American railway regime had been dealt a major blow by the
populist movement, even as other elements of the regime remained stable. This did not
threaten the regime before the development of motor transport as a viable challenger, but
it did make the railways more vulnerable when such an alternative did appear, as is
evidenced in the backlash against the railways’ proposed legislation during the 1930s. By
this time, the story-line about rapacious, exploitative railway managements, having been
established by populists several decades beforehand, was so durable as to be able to block
legislative changes.

While this re-organization will have to be further developed through theoretical and
empirical research, it shows promise in accounting for some of the anomalies in the case
studies, and suggests a promising direction for further research on this framework.

6.5. Generalizability

As with the multi-level perspective more broadly, this theoretical perspective is intended as
a heuristic device to guide research rather than as a “truth machine” that predicts exactly
how a transition will proceed. Since both case studies illustrate that most of the
conceptual propositions can be demonstrated in both national contexts, it is plausible that
the analytical model can be applied in other contexts. Just as the case studies in this thesis
illustrate dynamics that are not explicitly anticipated in the theoretical framework, however,
further research in different case studies will undoubtedly reveal other dynamics which can
be integrated into the framework to make it more effectively generalizable. It appears
plausible at this point that the analytical model could be effectively applied to further cases,
which can in turn be used to fill in more details about how story-lines develop during
different kinds of transitions.

A crucial question about the analytical model concerns whether it can be applied in sectors
other than transport. Transport systems are the subject of sustained public commentary,
because they are big, visible, expensive, often publicly funded, and they play an important
role in the daily lives of many people. Not all technological systems have this capacity to

917 Geels and Schot 2010.
918 Geels 2011.
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attract public debate. The makeup of the energy system, for example, might affect people working on or living near energy infrastructure, but the qualitative differences between a nuclear power station and a wind farm mean little to an energy consumer who just wants affordable power. Industrial production and water regimes are similarly hidden from view, as is much of the food system. Housing plays a larger role in peoples’ daily lives, and is subject to controversy, but is not directly connected to any one infrastructure in the same way as the systems discussed above. Because housing is mediated by a much larger variety of actors, including landlords, real-estate agencies, architects, and construction contractors, the decisions leading to changes in housing are more decentralized and thus not subject to the same kind of sustained collective debates. Biotechnology and medicine are subject to public controversies over regulation and ethics, but these occur mainly on a narrative level. Changes in biotechnology, for all their importance, are not easily visible in the daily lives of people who are not either on farms or in hospitals. Transitions in this area might be hard-fought during the legitimation phase, but relatively noncontroversial after that.

The telecommunications system might be another sector to which this framework could be profitably applied. Telecommunications companies play a direct role in the daily lives of consumers, and changes to telecommunications technology have big, qualitative effects in the lives of the people who use it. Furthermore, centralized decisions about telecommunications regulatory policy can be highly controversial, as can be seen in the current debate about net neutrality. An application of this analytical model to a telecommunications technology such as the internet, or the mobile telephone, could therefore be productive in debates about monopolies, innovation, and consumer activism within those sectors.

This discussion suggests that the analytical model will have to be modified to account for the most prominent actors in the transition it is being applied to. While simplifying story-lines still play a role in a transition which is mainly negotiated behind the scenes between experts, they will likely take a very different form than story-lines negotiated in public media.

6.6. Present and Future Implications of Research

If the analytical model is a plausible model of discursive contestation in transitions, it is important to ask what implications it might have for present-day and future transitions. This section attempts to answer this question by considering competing story-lines about
three transport technologies currently in development in the United States and the United Kingdom: High-speed rail, self-driving cars, and electric vehicles.

**High-speed rail:** High-speed rail is not a new technology, but is currently occupying public debate in both the United Kingdom, where a new high-speed rail line is planned to connect London with Manchester and Leeds,\(^9\) as well as in the United States, where new high-speed rail infrastructure is being planned at the state level.\(^2\) Both of these cases illustrate a crucial discursive problem suffered by infrastructure-intensive technologies such as high-speed rail, which impose very high financial and political costs for even comparatively small-scale demonstration projects.

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In the United Kingdom, negative story-lines about the planned high-speed rail extension have connected effectively with the cultural landscape by focusing on the damage to the countryside that will be caused by the new rail lines. These story-lines also develop narrative fidelity by invoking the spectre of Victorian railway magnates, as illustrated in one argument that “Rather than emulate the Victorian railway barons with the HS2 proposal, we should be looking ahead and building the digital and other infrastructure needed for 21st century technologies.” The opponents of high-speed rail have also called into question the empirical credibility of positive story-lines about the plan’s economic and environmental benefits. The new high-speed rail infrastructure might be built anyway, but only in the face of considerable public opposition.

In the United States, there is less explicit opposition to high-speed rail, and the projects enjoy the support of story-lines portraying them as a new, high-tech solution to the country’s transport problems (Figure 6.1). Vice President Joe Biden promoted these story-lines in an optimistic speech given in 2009:

> With high-speed rail system, we're going to be able to pull people off the road, lowering our dependence on foreign oil, lowering the bill for our gas in our gas tanks. We're going to loosen the congestion that also has great impact on productivity, I might add, the people sitting at stop lights right now in overcrowded streets and cities. We're also going to deal with the suffocation that's taking place in our major metropolitan areas as a consequence of that congestion. And we're going to significantly lessen the damage to our planet. This is a giant environmental down payment.

High-speed rail has little empirical credibility in the American context, however, which undermines the appeal of these visions. This problem could potentially be addressed with an effective state-level demonstration, particularly given that the American cultural landscape has proven more amenable in the past to large infrastructural projects than its British counterpart. In both countries, however, the limited support for high-speed rail demonstrates that new niche technologies requiring expensive infrastructure have a major discursive disadvantage, because their proponents are effectively forced to make a case for

stabilization before they have built any empirical credibility, actor credibility, or experiential commensurability in small market niches.

**Self-Driving Cars:** According to Google Trends, mentions of the term “driverless car” have increased sharply since 2010.\(^{924}\) Some analysts predict that such vehicles could play an important role in shaping future transport systems.\(^{925}\) Unlike high-speed rail, self-driving cars can exist quite easily in small experimental niches, because they can use existing infrastructure. Furthermore, successes in demonstration projects have given considerable empirical credibility to positive story-lines about self-driving cars, while the positioning of self-driving cars within high-tech narratives has given them narrative fidelity.

There are early signs, however, that self-driving cars might face legitimacy struggles as they attempt to expand into market niches. Even minor accidents involving self-driving cars have been covered in newspapers,\(^{926}\) suggesting that serious accidents could quickly give empirical support to powerful negative story-lines. Self-driving cars may also struggle with actor credibility due to negative perceptions of some of their promoters’ business practices. Criticism of the taxi app company Uber, for example has led to some rejections of self-driving vehicles as an alternative to existing public transit networks.\(^{927}\)

Since self-driving cars are in the radical novelty period, they are not yet widely perceived as a threat to the established car industry. This could change, however, if in the embedding period they begin to challenge prevailing models of car ownership and use. At this point, they will face opposition from an alliance of car companies and commercial drivers, both of whom will try to force them into an incremental role. Negative story-lines, which might draw empirical and experiential commensurability from flaws in self-driving car technology, will be aggressively promoted by this coalition. This suggests that self-driving cars, despite their relatively easy legitimation process thus far, might have a protracted struggle in their future.

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\(^{925}\) KPMG and Car Group, 2014; Araujo, Mason, and Spring, 2012.


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Electric cars: Electric cars, as discussed in both case studies, have been prominent in visions and in experimental niches since at least the 1970s. It is possible, however, that the latest generation of electric vehicles is moving towards the embedding phase, as policies and infrastructure favouring them is starting to appear in both the United Kingdom and the United States. Electric cars, furthermore, have a durable niche, and have empirical credibility due to their demonstrable performance.

Electric vehicles may gain some actor credibility from the status of Tesla Motors’ founder Elon Musk as a celebrity engineer, and they may also gain some narrative fidelity from their high-tech associations. Currently, however, electric vehicles are involved in a struggle over empirical credibility, particularly over their utility for long-distance travel. Tesla Motors, one of the most prominent developers of electric vehicles, perceives this issue to be sufficiently important that they filed a lawsuit against the television programme Top Gear, which they allege had misrepresented the range of one of their cars in a review. Experiential commensurability could also become a problem if charging stations are perceived as having long queues, or taking too long to charge the cars’ batteries.

6.7. Implications for Transitions Theory

The simplest way integrate the findings of this thesis back into transitions theory is to see the analytical framework as a fuller elaboration of the cultural and discursive dimension of a socio-technical regime. This research may, however, have a wider implication for the internal dynamics of regimes. While regimes are typically depicted as the result of stabilising feedback mechanisms, this research suggests story-lines within a regime sometimes have the opposite effect, becoming more of a destabilising influence as the regime becomes more stable, causing people to become more frustrated with it. In order for an incumbent regime to avoid the creation of negative story-lines, it must continue to score strongly on all four of the elements of frame resonance, meaning that it must be perceived to be functional, free from systemic problems, run by competent and trustworthy actors, associated with positive experiences, and consonant with wider cultural narratives. Because a mature regime will likely fail on at least one of these measures, and quite possibly on all four, anti-regime story-lines are very likely to emerge.

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928 Bakker and Trip 2013.
Niche innovations also have discursive challenges, particularly while their supporters attempt to secure basic legitimacy. A niche-technology must be seen as safe, viable, not too much of a nuisance, and not a fundamental threat to social norms, in order to generate support and attain legitimacy. Once a niche is perceived as legitimate, however, the case studies considered here suggest that it is relatively easy for niche actors to avoid further controversy by projecting their technology into a future in which its problems have disappeared. This is evidenced by the lack of persistent negative story-lines about cars during the overthrow periods in both the United States and the United Kingdom. If further empirical research confirms that this is not merely a quirk of the cases that were chosen for this research, then it suggests that a niche technology which has achieved legitimation has a much easier time developing positive story-lines than a mature regime does.

This suggests that stable story-lines might be an element of a regime which can tend towards instability rather than stability. The effect of this is normally small, otherwise regimes would be far less stable than they we observe them to be. Indeed, the American railways survived persistent negative story-lines for more than half a century before road vehicles could challenge them. These negative story-lines, furthermore, can be offset by positive story-lines, as they have been in the contemporary American motor regime. The existence of persistent negative story-lines, however, can make a regime vulnerable when it is threatened by other developments. If this is confirmed by further research, then it might have interesting implications for conceptions of regime dynamics.

6.8. Limitations and Next Steps

This thesis is an early attempt to account for discursive conflict in transport transitions, and therefore has some important shortcomings. This final section will consider some of these, and then propose some directions for further research.

Historical Methodology

The long, national-scale national histories considered in this thesis have limited the depth to which story-lines about road and rail transport could be considered within the time and space available. It was not possible to achieve empirical saturation with respect to any of the sources cited, and there were several categories of sources that were not considered at all, such as films, radio broadcasts, and, in the later periods, internet content. For similar reasons, the accounts of the cultural landscape in each period are very brief and shallow, emphasizing only the most relevant points. The findings of this research could therefore be strengthened with
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a more detailed look at a shorter time-frame, in just one national context. For example, a detailed research project focusing only on the perceptions of the road and rail safety records in the United Kingdom between 1918 and 1939 would be useful for further developing the account of story-lines motivating for the accommodation of a new niche technology.

Case Selection

The United States and the United Kingdom were chosen to provide information-rich contexts for further research, and the fact that both of them are wealthy, English-speaking democracies was valuable in facilitating comparisons between them. There are, however, many other contexts in which a transition might take place, such as in developing countries, non-Western cultures, or authoritarian political contexts. The fact that these contexts have not been considered limits the generalizability of the findings. Further research should therefore consider discursive struggles over transitions in radically different contexts to the case studies presented here.

Emphasis on policy decisions

The discursive struggles covered in this thesis primarily concern questions of transport regulation, infrastructural development, and subsidies. This is partly an artefact of the thesis’s use of documentary sources which tended to cover big public debates. Story-lines influencing consumer preferences to buy a car, or to travel by train, however, are also important when taken in aggregate, and do not show up as readily in historical documents. In order to fully understand how story-lines can influence the course of a transition, it is therefore necessary to give more consideration to how competing story-lines influence consumer preferences.

The role of power and resources

The analytical model for this thesis assumes that the resonance of a story-line is only determinant of its popularity. It is plausible, however, that even a highly appealing story-line will not have a wide impact if it is not promoted by actors with a large enough platform, and that an otherwise unappealing story-line might have some success if promoted by powerful actors. The role played by access to resources in promoting story-lines might play a bigger role than is accounted for here. Powerful actors within the mass media, the political establishment, or indeed
the incumbent regime, might have an advantage promoting their favoured story-lines.

Opportunities for further research

These limitations suggest questions that should be addressed in further research, which are discussed below.

- What influences the early acceptance of niche actors’ visions?
- What kinds of story-lines are most effective in building up a discourse coalition around a growing niche?
- Are there landscape conditions that make niche actors’ visions of the future more attractive?
- How do consumers apply story-lines in their consumption choices?
- How do story-lines about niche and regime technologies develop in sectors other than transport?
- How powerful can social movements, such as car clubs or environmentalists, be in transitions? Which discursive tactics are the most effective for them?
- How do public debates around transitions play out in other contexts, such as developing countries, authoritarian regimes, or non-Western cultures?
- How can powerful media or political actors shape public story-lines about technology to influence a transition?

These questions map out a promising research programme on the question of story-lines in transitions; one that should be pursued in order to better understand the cultural, discursive, and political complexities that entrench unsustainable systems. Based on the existing theoretical literature and two empirical case-studies, the framework presented in this thesis appears as a useful starting point for this discussion.
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