# Governance, Policy and Regulation in the Field of Automated Driving: A Focus on Japan and Germany


**Yukari Yamasaki, Torsten Fleischer, and Jens Schippl**

**Abstract** Sociotechnical development is often described as an evolutionary process of a series of connected changes in different domains, including technology, the economy, institutions, innovation policies, behavior, culture, ecology, and belief systems. Many experts point to the great transformative potential of automated vehicles in the mobility sector, and to a variety of pathways that lead to an imagined future made possible by automated driving technologies. However, the differences in state behavior and governance approaches which are entangled in such emerging technologies are less understood, despite their potential to influence the trajectory of sociotechnical development. This chapter examines the modes and methods of governance in Japan with respect to automated driving. In order to illuminate the Japanese characteristics, we compare them with the German approach. We provide a brief comparison of the two democratic and capitalist countries from three perspectives—politics, polity, and policies. We then present Japan's policy process, policy actors, and recent changes in its approach to automated driving. In Japan, automated driving is interrelated with other policy areas, such as science and technology, information technology, and demographic change issues, and has been contextualized primarily in relation to the economy, particularly during the term of Prime Minister Shinzo Abe (2012–2020). The state has historically tended to intervene in technological development, and in recent years the Cabinet has attempted to exercise a more top-down political leadership through policy conferences. While letting the government appear to be taking a leadership role, relevant industrial players also seem to exert a significant influence on the direction of automated driving policies through both formal and informal channels. To enable effective and efficient governance in complex fields such as mobility, researchers, policymakers, and others involved in

Y. Yamasaki (✉) · T. Fleischer · J. Schippl
Institute for Technology Assessment (ITAS), Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany
e-mail: yukari.yamasaki@kit.edu

T. Fleischer
e-mail: torsten.fleischer@kit.edu

J. Schippl
e-mail: jens.schippl@kit.edu



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governance require a good understanding of the factors that could influence future development pathways. Future research should build on these findings and conduct further comparative analyses between countries that have the potential to play a leading role in the implementation of automated driving.

## 1 Introduction

Automated driving (AD) has long been imagined and researched by governments. In this chapter, Japan is the center of interest. At relevant points, a brief comparison is made with the situation in Germany. In the early 1960s, a national research institute in Japan conducted research on automated highway systems [54]. Yet, since the early 2010s, driven by technical progress and unsolved challenges in the mobility sector, interest in the development of this technology has increased considerably in both the Japanese and German governments. This has been linked with growing expectations that AD will be a potential solution to various societal problems, and that pressure from non-traditional companies may change the player network of the domestic automotive industry. Accordingly, increasing budgets have been allocated to the research and development (R&D) of AD and its social implementation. Many experts point to the great transformative potential of automated vehicles for the mobility sector, and to a variety of different pathways that lead to an imagined possible future, with the associated need for governance [44].

For the two governments, transportation systems and mobility issues have been a subject of public policy from the perspective that they are an important part of human life and constitute the basic infrastructure necessary for many aspects of economic, social, and political activities. Along with the great gains in prosperity and quality of life through improved transport, however, the governments are also required to address the negative impacts of the externalities of mass car use, such as congestion, accidents, poor air quality, physical severance, social exclusion, and inactivity [7]. In addition, automobile policy has been a part of the industrial policy in terms of its significance as a key domestic industry in both countries. In recent years, new technologies and services in mobility fields, such as AD, have been addressed more frequently in science, technology and innovation policies. Thus, AD is discussed in different policy areas depending on how AD—technology, technology-applied products and systems, innovation, or means of transport—is conceptualized and contextualized in policy areas by experts and policymakers. In turn, different measures are discussed and/or implemented, such as transport planning and service provision, laws and regulations in social implementation, and subsidies and investment in R&D and infrastructure.

Different countries have different sociotechnical development paths. Even if it is recognized that we are in "a once-in-a-century period of profound transformation" of the automobile industry, as Toyota Motor Corporation's Annual Report 2018 states, technological innovation alone does not explain or predict how the sociotechnical system will develop in a country. The transitions are the result of a set of connected

changes in different domains, such as technology, the economy, institutions, innovation policies, behavior, culture, ecology, and belief systems [40, 53]. The main objective of this chapter is to achieve a better understanding of the role and relevance of political institutions in the development of automated vehicles in Japan, and on a more general level in Germany. The idea is to focus on state actions anchored in each country's history, culture, and ideology. AD is integrated into various policy areas, and the state can have different policy strategies and measures, which in part shapes the ongoing mobility transition. How the two states have actually been involved varies according to the ideological lens through which the state is viewed—neoliberal market orientation or 'welfare model,' or a blend of both [7]. Affected by this, differences in current sociotechnical systems manifest themselves as car-dependent societies or societies with well-developed public transportation systems. While it is not possible to fully anticipate the mobility transition due to the complexity of interwoven domains, an exploration of political institutions and governance styles in AD will deepen our understanding of the different state approaches and their potential influence on sociotechnical development pathways. The core of this chapter is a detailed analysis of the Japanese situation, strongly based on relevant policy documents in the field of AD. To clarify the characteristics in Japan, we compare the Japanese situation with that in Germany on several central points. Germany is well-suited as a contrast to Japan, as both countries have a globally leading automotive industry and are dependent on technical progress to maintain this leading role. Therefore, AD is a mandatory topic in both countries, not only for industry but also for innovation policy.

Section 2 compares some characteristics of state actions in Japan with those of Germany in three aspects—politics, polity, and policies. While explaining the role of government as shaped by traditionally observed actors' relationships and expectations in different policy topics, such as industry, science and technology, and public transportation, we explore the three aspects of state actions in both countries with regard to AD. Based on the characteristics discussed in Sect. 2, Sect. 3 examines the situation in Japan. The results of an empirical study on policy processes, policy actors, and recent changes in their approaches surrounding the topic of AD is described, with a particular focus on the period of the late former Prime Minister Shinzo Abe (2012–2020). In the final section, we reflect on some of the key findings from the study and consider how different political institutional settings and governance approaches may affect the trajectory of sociotechnical development.

## 2 Different Governance Styles in Democratic Capitalist Countries

The modes and methods of governance of AD vary from country to country, influencing the trajectory of sociotechnical development. Although Japan and Germany are both described as democratic and capitalist countries, their institutional patterns of

political and economic governance differ. In this section, we describe the differences in state approaches to AD in Japan and Germany from the perspectives of politics, polity, and policies, considering the historical context of each country. Deconstructing state action into the three components helps to analyze complex state approaches in the governance of AD [45].

## *2.1 Politics: Actor Relationships and Interactions Influenced by (Expected) Roles*

### 2.1.1 State-Business Relations in Capitalist Countries

Politics of interactions and power relations, as well as discursive interactions among political actors and communicative discourse to the public, have a profound impact on policy trajectories [45]. For a better understanding of the role of state and state-firm relations, we introduce the classifications of capitalism by Schmidt [45]. Based on the simplest dichotomy of capitalism—liberal market economies (LMEs) and coordinated market economies (CMEs)—by Hall and Soskice [15], Schmidt offered a third variety that can apply to countries that do not fit the binary division, namely, state-influenced market economies (SMEs). In the first variety of LMEs, the state provides a high degree of autonomy to economic agents in market capitalism and acts as an arbiter. The enabling state in the second variety of CMEs encourages associational governance and negotiation among private agents in managed capitalism, and acts as a facilitator. In the third variety of state-influenced market economies (SMEs), the interventionist state directly coordinates and intervenes in private activities in state-enhanced capitalism, and acts as a leader [45].

Looking at state-firm relations and the expected role of the state, especially in economy, industry, and science and technology policy, Germany may count as a CME, while Japan is more of an SME. Yet their behavior may shift slightly to other capitalism types depending on the administration and policy areas at a particular time, and hence, they cannot automatically be placed in the respective categories. Historically, however, the focus of post-war political economy design was different in each country: for Japan, to catch up with and surpass the West through national planning and industrial strategy and social integration through growth; and in West Germany, the consensus-oriented construction and protection of national social cohesion and solidarity with the principle of social equilibrium (Yamamura and Streeck [60], p. 2, Hundt and Uttam [17]). Despite a trend toward more "neo-liberalism" and associated privatization in some sectors in both countries since the 1980s, this did not result in a complete slide from *faire* to *laissez-faire* by leaving everything up to market actors in all public services and industries, because political actors never thoroughly embraced the market-oriented philosophy [33]. In Japan, political actions based on a "neoliberal" mindset were adaptive while maintaining the characteristics of the developmental state, rather than transformative [58]; the state has believed in

the need to take initiatives in the economy in order to control the results of competition in a particular direction, while industry also expects state leadership to set the overall goal [59]. The primary goal has consistently been economic development, not the establishment of a liberal market economy, and deregulation and economic openness approaches have been justified by the need to increase the international competitiveness of Japanese companies and industries, or the economy as a whole (Anchordoguy [1], chapter "Business Analysis and Prognosis Regarding the Shared Autonomous Vehicle Market in Germany", Hundt and Uttam [17]). In this sense, privatization and (de)regulation are merely one of the many policy tools to achieve the goal, which will be adopted when it is considered to contribute to its achievement [43]. As the state actively seeks a way to coordinate and develop the economy as a whole using different tools, the approach is different from *laissez-faire.*

Germany probably maintains its character as a CME in economy, industry and science and technology policy. However, Japan can still be included in the category of SMEs, given the traditionally larger role of the state, which has remained prominent despite significant retreat, as well as the close connection between the state and business, and the paternalistic firm-labor relationship [45]. What both countries have in common is a dense web of interrelationships between firms, their business partners, and government agencies. Industry players, especially automakers, appear to have exerted a significant influence on policy direction, particularly automotive policy, through established channels. However, a difference may be observed in that the Japanese government shows an outwardly more direct attitude toward orchestrating and guiding the private sector, whereas the German government rather facilitates coordination of the private sector [55]. This does not imply that, in Japan, the government engages in tyranny in the name of economic development, nor does it negate pluralist arguments that emphasize the role of non-state actors, such as industry, finance, and interest groups (for an overview of previous literature, see Mogaki [33]). The close relationship between actors bounded by socially-embedded communal norms, described as Japan's collective capitalism [17] or communitarian capitalism [1], has enabled the prominent, if not dominant, role of the state. Consequently, compared to LMEs and CMEs, the Japanese state has taken more than a facilitatory role by directly influencing the national trajectory in the economy, as well as science, technology and innovation. Following the so-called "lost decades"[1] due to economic stagnation, the state believes in the need for its traditional leadership role to initiate an economic revival, and is looking to rely on large domestic industrial powers such as Toyota Motor Corporation.

The relationship between the state and business sector depends on whether it is a public transportation operator or a manufacturer developing mobility-related technologies. For example, in Japan, after the deregulation of the taxi industry since the 1990s, operators lobbied the government to reinstate regulations due to

[1] Japan's "lost decade" refers to approximately 10 years since 1991, when the bubble economy collapsed. In the following decades, GDP growth remained sluggish affected by the global economic recession due to the global financial crisis (in 2008) and the COVID-19 pandemic (since 2020), as well as the Great East Japan Earthquake (in 2011), so that the years from 1990 to the present are sometimes collectively referred to as the "lost decades".

intensified competition, and regulations were reintroduced to protect taxi drivers. Likewise, the industry can influence the direction of (de)regulation in the introduction of ridesharing and AD. On the one hand, the taxi industry association has been against private-use onerous transportation/carpooling and has succeeded in not introducing it, except in certain remote areas. On the other hand, some large taxi companies welcome the introduction of AD, which would help the situation of aging drivers and labor shortages in the industry, and are actively involved in pilot AD projects. In governmental science and technology projects, the close relations between the state, manufacturers, and a few powerful universities have supported the promotion of national projects. Taking advantage of these close relations, the government promotes "all-Japan-efforts" by industry–academia–government collaboration in governmental projects such as SIP-adus (Cross-Ministerial Strategic Innovation Promotion Program, Automated Driving for Universal Service), especially in new innovation frontiers, or common infrastructure technologies that do not involve the private sector's area of competition [24].

### 2.1.2 State-Citizen Relations in Democratic Countries

Both Japan and Germany are described as democratic countries, if not normatively in Japan, at least operationally so. However, the two countries' democracies differ in specific aspects, and thus the manner in which government power is exercised in AD-related policy processes may vary. According to Merkel [31], five interdependent and independent elements comprise democracy: electoral regime, political rights, civil rights, division of powers (horizontal accountability), and effective power to govern. First, in Japan, division of powers and horizontal accountability function relatively weakly. The judiciary has not actively engaged in politics. Japanese courts have been very conservative and inactive in judicial reviews. Except for a very few cases, the Supreme Court has seldom held government actions unconstitutional, and has maintained its position to avoid constitutional challenges by readily accepting the arguments of the government, or fully respecting the decisions of the legislature [30]. In addition to the historical conservatism of the judiciary, deliberations in legislative bodies, to the extent that they are open to the public, are not very active, and the balance to reciprocally check each other has deteriorated in recent years [37]. All of these factors have opened a way to top-down governance within the institution, with the strengthened function of the executive body in recent years. Furthermore, in Japan, it is not always the elected representatives who have executed the power to govern. This means that public officials and industrial players have historically had a powerful role in certain policy domains. While purportedly representing the model of a developmental state or state-led initiatives, behind the scenes such extra-constitutional actors—who are not directly subject to democratic accountability—have been given leeway to exert their influence. How they are involved in policy processes and the change in power relationships among those actors are explained in detail in the case of AD policies in Sect. 3.

In Japan, even after forming a democratic system, the norms and values that citizens should practice on a daily basis in democratic thinking and civil behavior have not flourished [29]. Consequently, both inside the policy process and through the public sphere, the role of civil society with normative and participatory potential, which can act against authoritarian inclinations, has been comparatively marginal. In fact, only a minority of non-profit organizations engage in advocacy against the government [42]. Street protests rarely mobilize and, in most cases, have no power to change the direction of policy. In addition, Japan's low ranking in the Press Freedom Index for a democratic country indicates a problematic situation regarding the freedom of journalists and news organizations, while some prime ministers in the past have made a long-term government possible partly by keeping the mass media on their side, or by putting pressure on their appointments [57]. Furthermore, against the backdrop that the national government has positioned public transportation as a for-profit business, and that the history of collaboration between citizens and governments in regional transportation planning has been shallow, citizens have had limited channels for involvement in policymaking. In 2010, the Democratic Party of Japan and the Social Democratic Party, then in power, attempted to pass a basic transportation bill guaranteeing the "right to mobility/transport" as a government bill, but due to fierce resistance from different parties, automakers, and public transport service operators, the right was never included in the bill. The government was concerned that it would be accused of inaction as there was insufficient financial support for service operators to guarantee such rights. Local bus companies and regional railroad companies opposed the original bill despite the expected benefits of government subsidies, because their freedom to withdraw from unprofitable routes would be threatened, and the mandatory maintenance of such routes would not contribute to their business stability [23]. Owing to the absence of such rights, it is highly unlikely that citizens will make the lack of public transportation the subject of administrative court cases.

Meanwhile, the population's loyalty to a single political party, the Liberal Democratic Party (LDP), over decades has ensured unwavering control over policymaking with few interruptions, except for a very brief handover of power to other parties [39]. There has been an agreement between the state, business, and the public in Japan that state-led capitalism and technological development are good for the collective interest of national growth, and therefore the developmental state model has been widely accepted. In this regard, the government has made concerted efforts to cultivate loyalty from citizens, and the narrative of the path of shared growth has enjoyed a considerable degree of popular legitimacy [17]. This capitalist regime of pursuing cycles of shared efforts for growth and shared distribution which subordinate social policy to the overriding policy objective of economic growth is called productivist welfare capitalism [16]. This does not mean, however, that social objectives were disregarded; on the contrary, social objectives such as strong firms, technological self-sufficiency, and a cohesive community have been the top priorities. Grounded on the communitarian norms, governmental leaders have pursued policies that represented a wider consensus about what was important [1]. Although support for the developmental regime seems to have decreased since the economic slowdown of the 1990s and worsening technological self-sufficiency, citizens' criticisms may be

directed at governmental measures, but not at the governmental role in paternalistic leadership [17]. In Japan, citizen dialogue aims to foster citizens' (or probably rather future consumers'/users') understanding and acceptance of AD, and the government may play a director-like role in organizing such communication activities.

In the German tradition, it is generally agreed that the division of the state powers of legislative, executive, and judiciary bodies, and the horizontal accountability among the powers are an important part of the rule of law and democracy [31]. Following the Nazi era, one of the elementary goals was to design the Basic Law of the Federal Republic of Germany in such a way as to avoid an excessive concentration of power. The responsiveness and responsibility of the government are considered to be secured through mutual checks and balances, and therefore, the exercise of executive power appears to be more balanced and limited when compared to Japan. Although German legislation does not establish the right to transportation (for example as is the case in France), the competent authorities have legal responsibilities for the population to be adequately served by local public transportation services, in line with the principles of climate protection and sustainability. German citizens, especially those with reduced mobility or sensory impairments, are given several formal and informal opportunities to participate in the formulation process of local transport plans (see chapter "Social Acceptance of CAD in Japan and Germany: Conceptual Issues and Empirical Insights" of this book regarding the high level of support among the German public for involvement in the planning of autonomous vehicles). In addition to formal participation in transportation and land-use planning, citizens' input has also been reflected in discourses and framing of technological innovation through social movements since the 1970s [4]. Policymakers are sensitized by public reactions, and social dialogue is often considered essential to the success and social acceptance of emerging technologies and new planning. In these cases, dialogue is viewed as a process of negotiation in which benefits and risks are carefully deliberated, rather than as mere communication to build trust among stakeholders and justify decisions. In principle, citizens are expected to be *citoyens* whose civic duty is to participate responsibly in democratic decisions and public life, including the assessment and governance of technology. In Germany, the role of government is imagined as a mediator that facilitates social negotiations by enabling exchanges among citizens, science, and industry. This process is believed to enhance the democratic legitimacy of policy decisions in emerging technologies such as AD. This institutionalized practice of consensus-seeking for collective choices is a result of institutional traditions established after World War II, in which creating and maintaining social equilibrium has been deeply interwoven in political and economic governance [4].

## *2.2 Polity: Institutional Settings in Political Arrangements*

State actions are influenced by different political arrangements in a country. That is, whether it is a single authority in unitary institutional structures, or a federal or

regional institutional structure distributed among multiple authorities; whether it is a statist or more corporatist policymaking process; whether it is a system of majority representation or proportional representation; and how the public participates in politics [45]. While political decision-making arenas for the transportation system have been rather centralized in Japan, policymakers in Germany are required to formulate relevant policies in multi-level governance—at the European, national, state, and local levels. The European Union (EU) actors, such as the EU Commission, the European Court of Justice, and the European Parliament, the federal government, and local authorities influence one another on relevant regulations and transportation system developments. To facilitate vertical coordination at different levels, the federal government may need to act as a policy moderator rather than a policymaker, and it has a role as an advocate for local communities vis-à-vis the EU Commission [2]. Moreover, in a coalition government, negotiations between parties with different interests are inevitable, especially on topics that straddle different policy areas, such as AD. Additionally, although the polity in both countries is democracy, the two countries' democracies differ in specific aspects, as explained in Sect. 2.1.2. The state-citizen relations and the nature of civic participation in each country differ due to the different institutional traditions. This political institutional context provides an explanation for the coordination mechanisms among political actors, and whether the state can exercise its power to impose policies relatively easily [45].

## *2.3 Policies: Interpretation of AD in Different Policy Areas*

The topic of AD has been discussed in different policy areas, such as public services, industry, and science and technology. How AD is conceptualized and interpreted in different policy areas is influenced by how the government conceives of public transport and science and technology in relation to the state and its population. Accordingly, governments may take different substantive political actions and strategies. For example, in Japan, the public transport sector, including railroads, buses, and taxis, was a main target of privatization and deregulation from the 1980s to the early 2000s to improve profitability and competitiveness, which has resulted in the majority of transportation services being provided by private companies. 1987 saw the privatization of Japan National Railways (JNR) and its division into JR companies. Then, in 1996, the Ministry of Transportation (now the Ministry of Land, Infrastructure, Transport and Tourism, MLIT) decided to loosen the supply–demand adjustment regulations for all modes of public transportation. In accordance with this decision, bus deregulation measures were implemented in 2002 to lift the permit system for entry and exit from the business, resulting in the withdrawal of bus operations in rural and suburban areas [47]. Public transportation has been considered as a for-profit business for a long time, and the role of national and prefectural governments has been limited mainly to supervising and coordinating operators [41, 48]. However, the decline in public transportation in recent years has been interpreted as a decrease

in the vitality and productivity of local residents in their economic and social activities, and the government has once again taken up public transportation as a policy concern. Thus, the transportation sector has been discussed in Japan in the context of the profitability of the operators, and the vitality and productivity of residents through mobility. Responding to the situation of declining public transportation in rural and suburban areas, the "Basic Act on Transportation Policy" was enforced in 2013, and the "Act on Revitalization and Rehabilitation of Local Public Transportation" was amended in 2014. These clarified the responsibilities of the national government, prefectural governments, local governments, operators, and citizens in public transportation policy, and as a result local governments can now take more proactive roles in public transportation policy by establishing a "regional public transportation network formation plan." Yet, this is still a new trend, and many municipalities have difficulties in responding immediately to the given responsibility in terms of their institutional structure, personnel, and budgets [48].

In Germany, public transport services have been consistently interpreted as elementary services of public interest, and the state has a duty to ensure mobility in accordance with the welfare state principle (Article 20 (1) of the Basic Law for the Federal Republic of Germany). In 1938, the concept of Daseinsvorsorge (public service) was proposed by Ernst Forsthoff, a German scholar of constitutional law, with the intention of clarifying the relationship between the individual and the service-providing state. While he noted that it is impossible to limit the scope of Daseinsvorsorge in quantitative and qualitative terms, the provision of public transportation was named as one such service. This idea continued in administrative practice in the post-war period. In 1993, the Law on the Regionalization of Public Transport was enacted, which specified the responsibility of authorities to secure an adequate level of public transport services for the population in their territories in accordance with the provision of services of general interest (§ 1 Regionalisierungsgesetz—RegG). This federal law decentralized the responsibility for planning, organization, and financing of local public transportation to regional governments (§ 3 RegG). Each regional government has the further authority to designate administrative bodies to carry out the administrative practice of urban transportation, and the designated local agencies are responsible for ensuring that residents are adequately served by local public transportation services in line with the principles of climate protection and sustainability (§ 8 Personenbeförderungsgesetz—PBefG). Thus, the concept of Daseinsvorsorge, hitherto legally undefined, requires competent regional and local authorities to guarantee the provision of adequate short-distance passenger transportation services that meet the ordinary mobility needs of individual population groups, even if the provision of these services is not undertaken by the governments themselves or by public enterprises. Therefore, the provision of services is not categorized as a private activity, as it is in Japan, and the German public transportation system has only partially opened up to direct competition amongst companies. The competition is highly regulated within the framework of a heavily-substituted service sector [2]. The role and responsibilities of public entities in public transportation appear to be significant, in that securing provision of public passenger transport services remains, in principle, the responsibility of the state.

In accordance with the principles of climate protection and sustainability, many policymakers in Germany tend to consider new mobility services, such as AD taxis and shuttles, as complements to, not replacements for, the public transportation network. In this context, it should be noted that a new legal regulation related to AD was approved in Germany in 2021. Under this law, Level 4 vehicles (for levels of AD see the introduction) are principally allowed to operate in mixed traffic, on public roads, in predetermined areas in Germany. The AD vehicles are allowed to operate without a driver on board. However, a technical supervisor who can deactivate or enable driving maneuvers of the vehicle from outside is necessary. It is possible for one person to simultaneously supervise several vehicles. A directive specifying the implementation of the new law was approved in May 2022. It is assumed that the new law particularly supports the integration of Level 4 vehicles into public transport services. Public transport operators are considered particularly suitable to meet requirements such as the provision of a supervisor. Many experts expect this to be the first step towards significantly more sustainable and less carbon-intensive mobility based on a new generation of public transport services [5]. Thus, the differences in public transportation policies in Germany and Japan stem to a large extent from the different ways of conceptualizing transport or mobility in each country, which in turn may result in different actor constellations and different approaches to the social implementation of AD. In Japan, privatization and regulatory measures have influenced the public transportation sector, with the aim of enhancing capitalism through state intervention in private activities, which is a typical approach by SMEs. However, in addition to the shallow history of local transportation planning, privatization has created a situation where it is rather difficult for the state to take strong initiatives in comprehensive mobility system development, including the public transportation network. Although the state seems to continue to hold the strong idea of improving economic efficiency in the mobility sector through state intervention, discussions on how AD should be integrated into the public transportation network cannot proceed without communication and cooperation with private companies and for-profit public transport operators. In Germany, the state has different motivations to engage in public transportation than is found in SMEs, in that it interprets public transportation as a fundamental public interest in the welfare state. However, policymakers who have been utilizing different policy instruments, such as regulations, subsidies, and transportation planning, may be able to provide direction more proactively in discussions on how AD can be integrated into the public transportation network. Furthermore, different development pathways of AD may have different consequences, depending on whether, for example, public transport companies in Germany would play a leading role in the integration of AD vehicles and services.

Moreover, the interpretation of the role of science and technology in society is not the same in both countries. In Japan, the liberalization policy has resulted in a limited, indirect government role for public transportation, while its role in the development of science and technology has been consistently emphasized. In the past, the national government has taken the initiative in the import and development of basic and applied science, recognizing the need to catch up with industrialized and advanced nations with the greatest speed [11]. Scientific and technological independence, or

technological superiority, has been considered to improve national security, and this technonationalism has been a key concept in Japan. In such technonational regimes, the government assumes responsibility for guiding industries and markets. It is not that Western countries have never pursued national security through technological leadership, but Japan, like other East Asian countries, may represent an extreme case whereby a national technological development vision is supported by government leaders as well as domestic enterprises [22]. In the 1980 edition of the White Paper on Science and Technology formulated by the former Japanese Science and Technology Agency, a vision of "*Kagaku Gijutsu Rikkoku*" (nation-building by science and technology) is mentioned as a national goal, and became a long-lasting slogan of the Japanese government. Furthermore, recent government innovation policies are based on the idea that the ability to generate technological innovation is essential to sustain economic growth [8]. Against this backdrop, AD has often been discussed in science, technology and innovation policies in Japan over the past decade. In more recent years, AD began to be discussed more often in the context of public transportation, as the social issue of public transportation withdrawal in remote areas has emerged, and practical application of AD is expected in the service sector sooner than in the private car sector. Yet, policies on mobility tend to be subordinate to the national vision of a smart and digital society based on new science and technology; AD is first and foremost contextualized in Japan in relation to new technology and innovation that should improve national security, promote economic growth, and solve social issues. In this way, state actions on AD are influenced by government expectations of science, technology and innovation, and the expected role of the government in realizing those expectations.

Driven by the expectations that science and technological superiority and the ability to generate technological innovations will improve national security and sustain future economic growth, the Japanese government has defined its own role in realizing these expectations by demonstrating leadership. However, the policy has also changed in response to the perceived needs of the economy at a given point in time [38]. During the "catch-up" period (1950s to the early 1970s), which brought about the economic miracle, the state played the most direct role in economic coordination. It was argued that national technological upgrading could benefit from policies that emphasized cost–benefit considerations and performance criteria, and thus could moderate the distorting effects of policy interventions [8]. Later, in the 1980s, the weight of R&D shifted from the improvement of imported technologies to domestic invention, and companies were expected to innovate within their own organizations, using their own capacities. Since 1990, during the recessionary period after the burst of the bubble economy, the state has recognized the importance of a growth strategy through science-based innovation, in which the research outcome should be applied and developed for industrialization [38]. It then increased government spending on R&D to the level of major Western countries. However, increasing budget deficits, coupled with the rather unsatisfactory outcome of the attempt to introduce a market-based framework of innovation systems by limiting the government's role, led the government to adopt a more top-down style of priority-setting and planning in R&D and social implementation. From this perspective, science-based

innovation, including information technology, has been prioritized [24, 25]. In this regard, automation technologies are recognized as an important technological area by the government, in terms of the interaction between scientific activities and industrial innovation. Thus, Japan maintains its SME character in science, technology and innovation policy, except for the brief attempt at a market-based framework for an innovation system.

In Germany, the expectations of science and technology are twofold: economic welfare and environmental improvement (or sustainability in a broader sense). Scientific and technological innovations are expected to advance economic progress, while diminishing the unintended side effects of modernity [4]. Although both Germany and Japan have similar expectations of economic advancement through the promotion of science and technology, there is a nuanced difference in that in Japan, the expectations for economic growth through technological superiority are interrelated with national (economic) security. In Germany, the expectations of environmental improvement by innovative technologies seem to be largely shared by both policymakers and citizens (see chapter "Social Acceptance of CAD in Japan and Germany: Conceptual Issues and Empirical Insights" regarding German citizens' expectation of environmental improvement through AD), as a result of the success of ecological movements since the 1980s in incorporating environmental problems into the social and political discourse of technological innovation. The coalition agreement of the new German government signed in November 2021 states: "Mobility should be made sustainable, efficient, barrier-free, intelligent and affordable for all." The decarbonization of the mobility sector is mentioned as an overall objective. Accordingly, the national strategy on AD as a technological innovation assigns a relatively high degree of importance to economic and environmental issues. The role of the government includes deliberation on the potential positive and negative consequences of emerging technologies, which are often assessed and governed in accordance with the precautionary principle [4]. In this way, climate protection is a concern in both topics of public transportation and scientific and technological innovations, and AD is often closely interconnected with environmental policy in Germany.

Actors' relations, influenced by the roles expected of them by others (as discussed in Sect. 2.1), can be seen to differ across policy areas. In Japan, the government believes in its responsibility to guide industries and markets in a technonational regime, and industry and the public also expect the government to exercise leadership in economic and science and technology policies by setting an overall goal. In Germany, in transportation and science and technology policies, the government serves rather as a mediator or moderator in social and political negotiations with citizens and other political actors at different levels. The responsibility for ensuring public transportation services is placed on the government, and German citizens therefore expect the government to play a more prominent role in public transportation policy than Japanese citizens probably do. At the same time, in Germany, citizens are expected to participate responsibly in democratic decisions on public life, where both technology and mobility are relevant issues. Such expectations of each other's roles in these different policy areas influence how these actors interact and whether the resulting political decisions will be accepted by them.

In this Section, in order to understand the differences between state actions and governance styles in AD in Japan and Germany, we presented different aspects in politics, polity, and policies: actor relations influenced by their expected roles; centralized or multi-level, and contrasting democratic political arrangements; and contextualization and conceptualization of AD related to different interpretations of technological innovation and public transport. Section 3 examines the policymaking arena and the central actors in Japan, which have changed significantly since the last century, with examples of AD-related policies. Based on a literature review of past and recent Japanese policymaking, policy documents, strategy papers, meeting minutes, and government websites were investigated, with a particular focus on the period of former Prime Minister Shinzo Abe (2012–2020).

## 3 Policy Processes, Power Relations and the Recent Changes in Japan

### *3.1 Traditional Policy Process*

The developmental state, or the Japan Inc. model, in the post-war period was featured by the mutually dependent, reciprocal relationship among interest groups, politicians and bureaucrats described as "*Iron Triangles.*" To many outsiders, this appeared like collusion, because new proposals were submitted for approval to the Cabinet and to Parliament only after agreement was reached among them [8]. The balanced equilibrium among institutions, policies, and socioeconomic blocs has provided a "positive cycle of reinforcing dominance" [39]. In the institutionalized mode of cooperation on technological upgrading, the Ministry of International Trade and Industry (MITI, now the Ministry of Economy, Trade and Industry, METI), together with the Ministry of Finance, served as the main conduit for economic governance throughout the second half of the 20th century [17]. MITI played a significant role in shaping future directions by identifying future prospects for social and economic needs, combined with approaches such as technology foresight and close cooperation with related industrial policies. During the period of catching up with the West, until the early 1980s the Japanese government and industry mostly shared the same expectations, preferences and possibilities with respect to their futures, based on a mutual goal of wealth creation through technological development. Wealth was commonly defined in terms of capital accumulation and creation of value-added goods and services. In line with this consensus, industrial and academic contributors to vision formulation were in return given the opportunity to participate in national R&D programs to realize the vision [56]. The "eye-catching" and "reliable" future visions of the government, according to Shinji Fukukawa, former vice-minister of MITI, had served as the guideline for the private sector and gave dynamism in the business direction [10]. This outstanding presence of MITI in post-war industrial policy, which was considered to have contributed to the miraculous economic growth

in Japan, was featured in Chalmers Johnson's 1982 work, *MITI and the Japanese Miracle* [26].

The ministries utilized a council that was attached to each administrative agency of the state, whose bureaucratic servants virtually controlled policy through the councils, by holding important secretariat functions such as selecting council members and setting the agenda [37]. Meanwhile, the LDP exercised political oversight largely through the functionally-specific committees of its Policy Affairs Research Council (PARC) in close cooperation with bureaucratic agencies. The problem with this vertically separated council system was that it did not provide an opportunity for an independent cabinet to initiate legislation, or a policy arena for the comprehensive horizontal coordination of ministry boundaries and interrelated topics, which had not been a problem when there was a strong consensus regarding catch-up [37, 39]. This policymaking environment has, however, experienced gradual but radical change since the turn of the 21st century, following the collapse of the bubble and a series of scandals involving élite bureaucrats, as well as incessant waves of globalization [26].

### *3.2 Power-Shifting to the Prime Minister's Office*

Problem-awareness that the government officials who should have been assisting in policy planning and execution led the politics, and the government was too dependent on them—the LDP's "headless" government (Mishima [32], p. 105)—was widely shared when entering an era of low growth and persistent budget deficits in the 1990s. However, with the purpose of increasing the leadership of politicians, the power was shifted to a core executive centered on the Prime Minister (not to Japan's bicameral parliament, the National Diet), an approach known as "*Kantei Shudō*" (the Prime Minister's Office's leadership), and thereby the era when it was ridiculed as "*Kanryō Shudō*" (bureaucratic leadership) in the last century came to an end [3, 33, 37]. The state's central organization went through several steps to strengthen its political leadership. The first step was electoral reforms in the early 1990s, the second was the Hashimoto Cabinet's administrative reforms in the late 1990s, and the third was reforms of the civil service system, which began in earnest at the beginning of the 21st century, and eventually established centralized control of senior civil servants by the Prime Minister's Office [37], Preface). In brief, the reforms of the election system and the political funding system in 1994 resulted in a weakening of "*Habatsu*" (political factions in the party) of the LDP, as well as "*Zoku gi'in*" (parliamentarians who specialize in a political area, and therefore have strong connections with the private sector and departments in ministries of that area), and concentrating the power and money in hands of party leaders [32]. As a consequence, bargaining and competition among the factions and "*Zoku*" in LPD, which used to activate discussions in the PARC (called "*Seichōkai*" in LDP) in order to coordinate different interests within the party, also receded [37].

Through the administrative reforms of the Hashimoto Cabinet in the late 1990s, which aimed to eliminate the negative effects of vertically divided administration and strengthen government functions, the new structure of government ministries and agencies started in 2001. In these reforms, the number of councils in ministries, where public officials previously exercised their power, decreased. Instead, the Cabinet Office was given responsibility for the general coordination of matters for which it was difficult to specify the dedicated ministry or agency, and the Cabinet Secretariat was confirmed to be responsible for the overall coordination from the perspective of directly assisting the Prime Minister as the highest and final coordination body under the Cabinet [46]. This led to the erosion of many of the previously close ties between ministries and interest groups [39]. At this time, the Prime Minister was also given explicit authority to request an agenda for Cabinet meetings and to initiate legislation, and some posts for political appointments of career bureaucrats were newly established, such as the Special Advisor to the Prime Minister, the Assistant Chief Cabinet Secretary, and the Cabinet Public Relations Secretary [37, 46]. These reforms created a foundation for a form of governance that enabled the Prime Minister and other core executives in the Cabinet Secretariat, as well as some ministers, to take leadership. Then, the policymaking mechanism through policy conferences was institutionalized through the political leadership of Prime Ministers such as Junichiro Koizumi (2001–2006) and Shinzo Abe (2006–2007, 2012–2020), and by then Democratic Party of Japan when it was in power (2009–2012).

Currently, political strategies on important topics are developed mainly in "*Seisaku Kaigi*" (policy conferences). Although there is no official definition of policy conferences, mainly two different types of exist: the five councils on important policies that were established in the Cabinet Office as a result of the Central Government Reform in 2001, and those designated as policy conferences among various bodies operated directly by the Prime Minister's Office or the Cabinet Secretariat [37]. Unlike those in the first group, the establishment of the second does not require a decree, and flexible setting-up by the Cabinet is possible. As a consequence of this flexibility, the number of policy conferences has increased from only 39 in the Mori Cabinet (2000–2001), to 168 in the second Abe Cabinet (2012–2014), which includes 114 newly established conferences during his time (Nonaka and Aoki [37], chapter "Setting the Scene for Automated Mobility: A Comparative Introduction to the Mobility Systems in Germany and Japan", Sect. 2).

The efforts by the Japanese government to reduce bureaucrats' dominance in the policymaking process have made significant changes in their relations. Especially, the establishment of the Cabinet Bureau of Personnel Affairs in 2014 by then Prime Minister Shinzo Abe seems to have had an impact on power relations. At this time, it was decided that the Chief Cabinet Secretary had the right to create a list of candidates for approximately 600 senior positions in the civil service, and ministers were required to consult with the Prime Minister and the Chief Cabinet Secretary prior to appointments, dismissals and demotions [37]. Previously, each ministry and agency had the right to prepare a list of candidates for approximately 200 positions of chief of bureaux. Through this strengthened authority over appointments and dismissals, the Prime Minister and the key members of the Cabinet Secretariat gained

more control over governmental officials. Furthermore, following the condition that the number of career bureaucrats working in the Cabinet Secretariat can be flexibly determined by a Cabinet order, the staff number has increased significantly from 1,054 in 2001 to 2,929 in 2015. In 2015, about one-third were whole-time positions in the Cabinet Secretariat, another one-third were concurrent staff members who kept their position in the ministry or agency but were stationed in the Cabinet Secretariat, and the remaining third were concurrent employees who were stationed mainly in their ministry or agency [46]. Today, the Cabinet can easily gather preferred personnel for policy conferences, depending on the topics of interest.

In most cases, it is still bureaucrats who write policy proposals as they did when it was called "*Kanryō Shudō*"; however, they now work in the secretariats of policy conferences directly run by the Cabinet Secretariat or in the Cabinet Office. They are under regular supervision by the Prime Minister, Chief Cabinet Secretary, and responsible ministers, making it impossible for them to avoid oversight [32]. Ultimately, "the discussions in conferences are more like a ritual," since the overall policy direction is more or less previously decided by the team in the Prime Minister's Office (Tanaka [50], p. 75). There is no change to the main idea in policy proposals prepared by selected bureaucrats working in the secretariat of policy conferences, and the meetings are rather a place to justify the proposals submitted by invited experts [27]. Indeed, conversations in published minutes of meetings of the Road Traffic Working Group under a policy conference called IT Strategy Headquarters, which is supposed to formulate Public–Private ITS Initiative/Roadmaps, suggest that expert members from academia and industry simply comment on drafts already prepared by the secretariat.

Depending on the policy focus of each Prime Minister, some bureaucratic officials from ministries would be assigned to higher or closer positions to the Prime Minister, and therefore they have opportunities to influence policy direction. During his second tenure of office, bureaucratic officials from METI were in favor of Prime Minister Shinzo Abe; for example, Takaya Imai, a civil servant from the ministry, held a key position of Executive Secretary to the Prime Minister, as well as Special Advisor to the Prime Minister [35]. On the topic of AD, bureaucratic officials from departments that have conventionally been involved in policy areas of road traffic, road transport, and automobiles seem to still play significant roles by being summoned to policy conference meetings. For example, bureaucratic officials from the following divisions or positions often attend meetings of AD-related subordinate bodies under policy conferences: Automobile Division, Manufacturing Industries Bureau, METI; Road Traffic Control Division, Road Bureau, MLIT; Engineering and Environmental Policy Division, Road Transport Bureau, MLIT; Land Mobile Communications Division, Telecommunications Bureau, Ministry of Internal Affairs and Communications; Traffic Planning Division, Traffic Bureau, National Police Agency (NPA); and the Counselor of the Commissioner-General's Secretariat of the National Police Agency. This wide range of departments in charge shows the vestiges of a vertically-divided administration, and AD-related topics involve the territories of different ministers and agencies that were previously siloed. Bureaucratic officials who are called to

policy conferences will try to maximize the interests of their own ministry or department, while conjecturing the Cabinet's desire in the overall direction of the policy topics of the conferences.

Although the influence of bureaucracy is somewhat preserved, it is now under the leadership of the core executive, centered on the Prime Minister. The core executive is a close circle of key central actors, composing an asymmetric position of dominance over other actors in the policymaking arena [33]. In terms of AD-related policy, core executive such as the Prime Minister, relevant Ministers of State, other politically appointed officials, such as the Chief Cabinet Secretary, appointed bureaucratic officials from METI, MLIT, and NPA, seem to play a significant role. In topics such as AD, in which different authority departments and industrial players have a strong interest, one wonders how the circle of the core executive can have strong leadership and proceed in a fixed-game manner in the direction and discussions of policy conferences. There is likely to be an undisclosed process for consensus building, known as "*Nemawashi*," outside the officially-recorded policymaking process. For example, according to Takenaka [49], Minister of State for Economic and Fiscal Policy in the Koizumi administration (2001–2006), secret strategy meetings of the so-called CPU (Communication and Policy Unit) were held every Sunday by a close circle of the core executive, such as the Minister of State for Economic and Fiscal Policy, the Chief Cabinet Secretary and Deputy Chief Cabinet Secretary, and a key member from a business field in the Council on Economic and Fiscal Policy. This CPU seemed to have continued during the second Abe administration. In addition, meetings were organized every day after lunch by the Abe Cabinet, attended by a small circle including the Prime Minister, the Chief Cabinet Secretary, three Deputy Chief Cabinet Secretaries, and the Executive Secretary to the Prime Minister, Takaya Imai from METI (Taniguchi [52], chapter 3, Sect. 1). This suggests very close communication among the important figures of the core executive. Furthermore, then Prime Minister Shinzo Abe had frequent visits to his office by bureaucratic officials and the private sector[2] (for more unrecorded meetings, see Machidori [28]). Thus, policy drafts may be written through meticulous preparation by the close members of the Prime Minister and bureaucratic officials who can surmise their superiors' wishes based on discussions between the core executive and industrial players outside the policy conferences. Policy documents are the result of such opaque, often undisclosed coordination processes to reflect the interests of stakeholders, and the resulting economic and industrial policies are promoted under the name of political leadership with the support of the industry.

[2] The comings and goings of visitors to the Prime Minister's official residence are recorded by news agencies throughout the day, and the data are distributed to daily newspapers. According to the Asahi Shimbun, then Prime Minister Abe had visits 157 times by public officials and 67 times from the private sector during the period of the first month in his second Cabinet. The summed number of visits is the highest compared to the equivalent month of the previous nine prime ministers since 2000. The trend of more visits by public officials and private sector representatives and fewer visits by politicians continues in the following Suga Cabinet. (https://www.asahi.com/special/shusho-1month/, accessed on August 23. 2021).

When the structure enabling the Cabinet to execute leadership in the policy direction was set up, the main (officially-recorded) policymaking arena shifted from ministry-based deliberation councils to policy conferences under the Cabinet or the Cabinet Office. As a consequence, this allows the Cabinet to pursue cross-cutting and innovative policy goals, unlike the previous "*Kanryō Shudō*" policymaking that constituted more or less minor adjustments within policy areas where the ministries had vested interests and territories, and therefore did not necessarily need clear national vision across different ministries [37]. The recent policy process seems to be facilitated by selected bureaucratic officials from specific ministries and agencies working for policy conferences who understand the Cabinet's intentions, as well as invited industrial players who are like-minded about economic policy. The cooperative top-down policymaking process is, however, far from transparent, with deliberations by active parliamentary politics reflecting the public will more comprehensively. How the National Diet is involved in the topic of AD is further discussed in Sect. 3.5 regarding regulatory processes.

### *3.3 AD Policy Process Through Policy Conferences Under Prime Minister Shinzo Abe*

The following policy conferences have published policy documents or strategy papers relevant to AD: the Headquarters for Japan's Economic Revitalization (abolished in 2020); the Council on Overcoming Population Decline and Vitalizing Local Economy; the Integrated Innovation Strategy Promotion Council; the IT Strategy Headquarters; and the Council for Science, Technology and Innovation (see Appendix in Table 1). Among the policy conferences, the first three were established by Prime Minister Shinzo Abe in his second tenure (2012–2020). One focus was to boost economic growth, which was largely supported in his election in 2012. After taking office he promoted tri-partite economic strategies known as "Abenomics" [3]. His strong political interest in the economy appeared, for instance, in that setting up the Headquarters for Japan's Economic Revitalization under the Cabinet[3] was decided in a Cabinet meeting on the day of his inauguration, despite a similar policy conference (the Council on Economic and Fiscal Policy), existing in the Cabinet Office since 2001. In addition, the Cabinet often insisted on strengthening the function of policy conferences as a command/control tower ("*Shireitō*"). As a consequence, the Japanese name of the IT Strategy Headquarters was changed to the IT "*Sōgō*" (comprehensive) Strategy Headquarters,[4] which confirmed that it should work to control the overall IT strategies of the government (IT Strategy Headquarters [19], p. 2). The Council for Science and Technology, whose predecessor had existed since 1959, also changed to the Council for Science, Technology and Innovation in 2014,

[3] The policy conference was abolished by the following Prime Minister, Yoshihide Suga, on October 16, 2020.

[4] The English name of the conference was left unchanged as the IT Strategy Headquarters.

which indicates the efforts to increase the controlling power over innovation by the Cabinet. Furthermore, the Integrated Innovation Strategy Promotion Council was established in 2018 directly under the Cabinet, despite the existing similar conference in the Cabinet Office; this was justified to improve the coordination of several "*Shireitō*" conferences related to innovation, including the Council for Science, Technology and Innovation, and the IT Strategy Headquarters (Government of Japan [13], p. 5).

Even though different AD-relevant policy conferences (see Appendix in Table 1) have their own topics to focus on, the Cabinet's interest in economic growth overarches them. The IT strategy was counted as a pillar of the growth strategy, which was one of Abe's tri-partite economic strategies (IT Strategy Headquarters [18], p. 2, 3). In addition, the second stage of "Abenomics," announced in 2015, tried to bring more attention to demographic changes from an economic perspective. The dwindling birth rate and aging population were reaffirmed as significant issues, in terms of the decreasing size of the working population, which is a decisive factor for economic growth, besides other factors such as capital stock and total factor productivity. This viewpoint linking demographic change to economic issues appears in the name of a conference: the Council on Overcoming Population Decline and Vitalizing Local Economy. Innovation was also recognized as a key to the economy, just as science and technology have always been identified as playing a vital role in industrial development and the economy. Based on the economic growth model from neoclassical economics, the Integrated Innovation Strategy 2020 also argues that the promotion of innovation is significant to increase total factor productivity, which contributes to economic growth, even under the condition that the increase of the (working) population in the future cannot be expected (Government of Japan [14], p. 7).

In those policy conferences with strong interests in the economy, technological development and system introduction of AD have been promoted with expectations to contribute to economic growth. At the end of 2017, the New Economic Policy Package was released, which was formulated in the Headquarters for Japan's Economic Revitalization and approved in a Cabinet meeting. It set the next three years until 2020 to work on "*Seisansei Kakumei*" (literally meaning productivity revolution, translated to "Supply System Innovation" in the English versions of the document) to raise the productivity of the entire Japanese economy. AD was mentioned in the section of "Societal implementation of the Fourth Industrial Revolution and the system reforms in the areas experiencing sluggish productivity" (Government of Japan [12], pp. 1–1, pp. 3–6). This New Economic Policy Package also decided to start the second Cross-Ministerial Strategic Innovation Promotion Program (SIP) ahead of the original schedule. Based on this push, the 12 issues, including AD continued from the first SIP, were formalized at the Council for Science, Technology and Innovation (IT Strategy Headquarters [21], p. 1). This sequence suggests that the policy conference of economic revitalization was in a strong position compared to other conferences, and the productivity improvement by AD seems to be a core promise shared by different policy conferences.

### *3.4 Continued Contribution by Industrial Players*

Industrial players and interest groups had been entangled in the Japanese policy network as a part of the "*Iron Triangles*", which they composed with LDP's "*Zoku gi'in*" (parliamentarians) and bureaucrats (relevant authorities) [51]. But they did not lose their long-standing institutional ties to the government, even after many of them had grown sufficiently to compete in the international market, and the custom of large companies participating in national projects continued [17]. As the nation's economic power stagnated, industrial players recognized the absence of political leadership as a "terrible problem," and retained the expectation that the state should provide direction and leadership for the economy (Witt and Redding [59], p. 873). While the power of "*Zoku gi'in*" and bureaucrats were fractured to some extent through the reforms with the emergence of the Cabinet described in Sect. 3.2, industrial players seem to keep a strong channel to execute influence over policymaking.

In some policy conferences, experts including industrial players who are not members of the National Diet, have been appointed to key positions. For example, in the IT Strategy Headquarters and the Council for Science, Technology and Innovation, experts from business fields are involved as members in the same position as some ministers. In subordinate meeting bodies of policy conferences, original equipment manufacturers (OEMs), automobile-related industrial associations and internet and telecommunication companies seem to dominate, while few conventional mobility service providers and consumer organizations participate (see Appendix in Table 1). The members from industrial fields are well-represented not only in policymaking, but also in the social implementation of AD by the government. For example, as of October 2018, the executive chairperson of DeNA Co., Ltd. was a member of a policy conference in which the Growth Strategies were drafted, and the mobile internet company was also counted as a member of the Road Traffic WG under the IT Strategy Headquarters to develop the Public–Private ITS Initiative/Roadmaps. The company's name also appeared regularly in the practical experiments of AD coordinated by the government. Similarly, Toyota Motor Corporation has been a member of the Council for Science, Technology and Innovation as well as some meeting groups under the IT Strategy Headquarters. In addition, the head of the Advanced R&D and Engineering Company in Toyota is the Program Director of SIP-adus. The selection of experts, especially those in subordinate meeting bodies under the policy conferences, might be rather arbitrary. It does not always require parliamentary approval, because the original purpose of those subordinate meetings is to investigate and research important matters in response to consultations by the Cabinet, and they are not required to make (political) decisions. However, in reality, Cabinet meetings often lack the original function of deliberation, so the reports submitted by the responding policy conferences to the Cabinet are hardly checked, and their decisions are very likely to be the final decision of the government [37]. In this sense, the policy documents that are developed by invited experts who succeed in making their preferred measures fit the overall government goals would easily pass the Cabinet. This is probably facilitated by "*Nemawashi*" through

undisclosed, informal visits and meetings between the core executive and industrial players outside the policy conferences. In addition, since similar expert members are summoned in different conferences, the drafted strategies including promotion of AD appear more or less homogeneous in different policy documents.

As mentioned in Sect. 3.3, during the terms in office of Prime Minister Shinzo Abe, policies in different areas, such as IT and science and technology, were promoted from the perspective of their contribution to economic growth and productivity improvement. His strong interest in economic growth, largely supported by the population, contributed to the industry's voice being stronger than ever. According to Kazuo Kyuma, formerly a standing advisor to Mitsubishi Electric Corporation, who served as a full-time member of the Council for Science, Technology and Innovation as of 2014, the national vision "Society 5.0" was developed by members of the conference including himself, Takeshi Uchiyamada (Chairman of Toyota Motor Corporation), the late Hiroaki Nakanishi (then Chairman of Hitachi, Ltd./then Chairman of the Japan Business Federation), as well as the secretariats of the policy conference and some contributors from the business world. The societal future concept was integrated in the 5th Science and Technology Basic Plan (5-year plan 2016–2020), and is often referred to in other policy documents by policy conferences to justify political measures including the promotion of AD. Kazuo Kyuma recalls that the voice of the industrial world was strongly reflected in the 5th Science and Technology Basic Plan, which was different from previous basic plans, in which ideas from academia had more consideration [36]. By supporting the leadership of the Cabinet, the industrial players seem to enjoy positions within or outside policy conferences to develop concrete ideas to contribute to the overall governmental goal of economic growth.

### *3.5 Rulemaking and (De)regulation*

To enable Level 3 AD on public roads in Japan, two Cabinet bills to amend the Road Transport Vehicle Act (RTVA) and the Road Traffic Act (RTA) were submitted to the National Diet in 2019 (for levels of AD see the introduction). MLIT is responsible for the first Act (RTVA), and NPA for the second (RTA). After a push by the Charter for Improvement of Legal System and Environment for Automated Driving Systems published in 2018, drafts of the amended law were prepared by bureaucratic officials of the ministry and the agency respectively, and the submission of the bills to the National Diet was decided by a Cabinet meeting.

The main purpose of the amendment of the RTVA was to set safety standards for the practical use of AD, including setting driving environment conditions by MLIT for each vehicle type, mandatory installation of a device to record driving data, establishment of a permission system for performance changes or modification of programs, and requirements for vehicle manufacturers to provide model-specific specifications to mechanics for inspections and maintenance. The amended RTVA newly defines "automated driving device," and the use of this is stated as "driving" in the RTA. This clarifies that people who use Level 3 automated vehicles will also be

regarded as drivers and must fulfil the obligations of a driver, as defined by the RTA. The amendment of the RTA includes obligation to record driving data by drivers, prohibition of operation outside the specified driving environment conditions, and obligations to take over driving authority and duties if the conditions are no longer fulfilled, while allowing drivers to use cellphones or other image display devices under certain conditions.

Japan has a committee-centered system in which the main discussion field in legislation processes open to the public is in committees, rather than plenary sessions [9, 37]. The topic of the amendment of the RTA was brought up on April 11, 2019 in the Cabinet Committee of the House of Councilors. This is one of the 17 Standing Committees that exist to address each policy area in both Upper and Lower Houses respectively; members of the National Diet must belong to one or more of the committees of the House. In the meeting of the Cabinet Committee of the (Upper) House of Councilors, six politicians from different parties each questioned the bill within the time allocated to them, and either the Chairperson of the National Public Safety Commission or bureaucratic officials who attended as reference persons provided answers, without any interruption by other politicians. The Chairperson of the National Public Safety Commission is a minister of state, which is the parent agency of NPA, traditionally in charge of the RTA. The meeting appears to be a question-and-answer session, or fact-checking session, for members of the committee to collect information. There was no time for deeper discussion based on the answers and information provided. Ultimately, the revised draft proposed by an opposition party was rejected and the bill was approved by a majority vote as originally submitted. At the end of the meeting, a supplementary resolution was jointly submitted by parties who expected certain political effects despite there being no legal basis for such a resolution.

The following day, the bill passed the Plenary Session of the House of Councilors. The bill was put on the agenda in a meeting of the Cabinet Committee of the (Lower) House of Representatives on May 24, 2019, which seems also to be more or less a question-and-answer session, in which five politicians asked questions. The bill was enacted after passing through the Plenary Session of the House of Representatives on May 28, 2019. In the Plenary Sessions of both Houses, the vote was immediately taken after a formal report from the committee. There were neither questions nor further discussions. A similar process was seen in the enactment of the amended RTVA. The bill was put on the agenda in a meeting of the Committee on Land, Infrastructure, Transport and Tourism of both the Houses, in which mainly bureaucratic officials or the Minister of Land, Infrastructure, Transport and Tourism answered questions from member politicians from different parties within an allocated time. The bill passed the Plenary Sessions without any questions or discussions. Subsequently, some ministerial ordinances and notifications that specify details of the contents of standards and regulations, and procedures for granting conditions for road vehicles were updated by MLIT. The two laws and ordinances for the type approval came into effect in April 2020.

The question-and-answer style in the Committees, and little or no debate regarding the bills in question in the National Diet, are partly due to the absence in Japan of

a thorough deliberative process for bill rewriting and discussing the bill paragraph by paragraph (called markup by the US Congress), and the lack of contestation in bill rewriting in the process [37]. Another reason is that negotiations may have occurred during unofficial processes before parliamentary deliberations. So-called "*Zizen Shinsa*" (preliminary review) by the PARC (called "*Seichōkai*" in LDP) is needed for the Cabinet to introduce bills to the National Diet. In the interaction with bureaucratic officials and interest groups, the National Diet members of the ruling party have exerted influence on the details of policy proposals [32]. Once the bill is approved by the party's general council, before it goes to the Cabinet it usually becomes subject to party discipline. In other words, once the Cabinet bill is submitted to the National Diet, politicians of the ruling party do not raise any opposition or amendment proposals. However, due to the weakened influence of "*Zoku gi'in*" by the 1994 reform and the stronger leadership exercised by the Cabinet through policy conferences, the preliminary review process was weakened. Even after the LDP's National Diet members almost lost the opportunities to influence rule-making through such unofficial processes, they remain quiet and obedient in the official sessions of the National Diet [37].

Parliamentary democracy, which weighs transparent deliberations and makes decisions that are comprehensible to the population, appears to be inactive in Japan, at least on the topic of AD. At the point of regulatory law amendments, the future mobility of/with AD is not questioned or discussed deeply by the National Diet members. Having few hurdles in rule-making will make accomplishing the initiatives much easier for the Cabinet, although it will not be achieved without the cooperation of the ministries and agencies, including their draft preparation, as can be seen from the different ministries and agencies responsible for the two laws of RTVA and RTA.

Policy conferences seem not only to work as an arena to develop strategies, but also rulemaking in recent years. The Charter for Improvement of Legal System and Environment for Automated Driving Systems was drafted in 2018 by a sub-working group, which was a subordinate meeting body of the working group (Road Traffic WG) that drafted the Public–Private ITS Initiative/Roadmaps under the IT Strategy Headquarters. The purpose was to examine what problems existed in the legal system and what kind of review was necessary to allow the driving of automated vehicles on public roads. The sub-working group was composed of technical and legal experts, as well as representatives from related ministries and agencies, and drafted the charter after four officially-recorded meetings (approximately 2 h per meeting). The achievement of a law amendment ahead of the technical development was noted as a significant success by an expert attending a meeting of the Road Traffic WG:

> A member of WG: First of all, the significance of the Public-Private ITS Initiative/Roadmaps is that the public and private sectors set a certain goal and proceed together in line with it in a concrete manner. In particular, in the area of automated driving, the development of laws usually lags behind the development of technology, but it must have been very significant that we were able to revise the laws ahead [of the technology development]. (IT Strategy Headquarters [20], p. 16)

Deregulation was counted as one of the focal measures for growth strategies to stimulate private investment under "Abenomics." Even though relaxing "*Ganban*

*Kisei*" (rock-solid regulations), which describes regulations that cannot be easily relaxed or eliminated due to strong opposition by those with vested interests such as government offices or interest groups, has never been easy even under top-down governance, the Cabinet has been pressurizing groups reluctant to reform. This trend continued in the Suga Cabinet (2020–2021), following the Abe administration. In a meeting of the Investment Promotion and Miscellaneous Issues Working Group under a policy conference named the Council for Promotion of Regulatory Reform in 2020, the Minister of State for Regulatory Reform urged MLIT and NPA to cooperate to relax regulations regarding field tests of AD, insisting on the economic importance of technological developments:

> Taro Kono, the Minister of State for Regulatory Reform at the time: If Japan does not lead the world in the development of automated driving, I think there will be no future for the Japanese automobile industry, but I think the reality is that there are many meaningless regulations in place, while such importance is not understood. […] If the administration does not understand that the future of the Japanese economy depends on this matter, I honestly believe that this is a big problem. I would like the National Police Agency and the Ministry of Land, Infrastructure, Transport and Tourism to always think about how important it is for the Japanese economy to create Japan's world-leading automated driving system, and the National Police Agency and the Ministry of Land, Infrastructure, Transport and Tourism to make decisions for it. (Council for Promotion of Regulatory Reform [6], p. 2)

These comments suggest that deregulation or legal reform cannot be easily implemented, even at the government's initiative, if the authority of ministries and agencies is reduced, or if there is opposition from affected interest groups. Nonetheless, responding to such pressure by the government, and following its aims for the introduction of AD transportation services at Level 4 around FY2022, and the nationwide expansion of such Level 4 transportation services in limited areas by around FY2015, a draft amendment to the Road Traffic Law to allow Level 4 automated vehicles was submitted by NPA in 2022. This was approved by the Cabinet and then passed smoothly by the National Diet. The amended law defines AD equivalent to Level 4 as "specified automated operation," and positioned it as not falling under the conventional definition of "driving." According to the newly-established "Permit System for Specified Automated Operation," business operators who wish to provide Level 4 transportation services are requested to submit a "specified automatic operation plan" and obtain prior permission from the Prefectural Public Safety Commission. This revision expanded the possibility that Level 4 AD will be introduced first for service vehicles rather than private cars. In this respect, it differs from the previous amendments to enable Level 3 AD, which allowed the Honda Legend to be the first to gain type approval and put on the market. This approach is based on the intention to realize higher Level of driving automation, starting with narrow Operational Design Domains (ODDs), where local public transportation that can be provided at limited locations within a limited time is suitable. The government expects that private vehicles will have drivers inside for a while, because, for such vehicles, technological developments that address broader ODDs are more prioritized than the achievement of higher Level of AD.

### *3.6 Increasing Budget*

The frequent reference to AD in various policy documents and pressure for deregulation to foster the social implementation of AD indicate growing attention to the topic in the government. Accordingly, public expenses related to this topic have increased notably in recent years. The financial resources of the SIP programs that started in 2014 come from a budget allocated to the Cabinet Office, under the item named Strategic Promotion of Science and Technology Innovation Policy. 50.4 billion yen was budgeted to the item for the Cabinet Office in FY2014, which slightly increased to 56.5 billion yen in FY2020. The item was categorized under the section of Acceleration of Growth Strategies in the estimated budget requirements for FY2020, and under the section of Intensive Investment and Implementation of Digitalization as a Driving Force for Building a New Normal and Improving Productivity for FY2021. Considering that only 249 million yen was budgeted for a similar item, Promotion of Science and Technology, in 2013 for the Cabinet Office, the increase is dramatic. Within the budget, the amount of money between 2.4 and 3.5 billion yen is granted every year for the AD-related program, SIP-adus. According to the NISTEP Resource Allocation Database of the National Institute of Science and Technology Policy [34], the ratio of science and technology-related budgets by the Cabinet Office to the total of science and technology-related budgets by all the ministries increased from 0.4% in 2013 to 2.5% in 2017. That is, the attempt of the Prime Minister's Office leadership in science, technology and innovation is also evident in the budget allocations.

The budget related to AD for METI and MLIT also saw a significant increase. For FY2014, 784 million yen was allocated to the R&D and Demonstration Project of Next Generation Advanced Driver Assistance System by METI. The budget for the item, R&D and Demonstration Project Expenses for the Social Implementation of Advanced Automated Driving Systems, first appeared in FY2017 with 2.6 billion yen, increasing to 4.2 billion yen in FY2019, and to 5 billion yen in FY2020, including Mobility as a Service (MaaS) projects. As for MLIT, 339 million yen and 145 million yen were budgeted in FY2017 for the Promotion of International Standardization of Technical Standards for Automobiles and the Promotion of the Advanced Safety Vehicle Project, respectively, both of which mention AD technologies in their explanations. For FY2020, 1 billion yen was requested by MLIT for the Promotion of the Development and Commercialization of Automated Driving Technologies, in addition to 141 million yen for the Promotion of the Advanced Safety Vehicle Project. In addition, the development of standards for road space compatible with AD and support for the social implementation efforts by local governments appears to be covered under the item, Linkage of Regions and Bases through Road Networks, which was budgeted with 257.9 billion yen in total for MLIT.

Before 2013, relatively small budgets were allocated to AD, which was treated as a part of intelligent transport systems (ITS). Altogether, approximately 4.36 billion yen was allocated for the 5 year- Energy ITS Promotion Project (FY2008-2012) to the New Energy and Industrial Technology Development Organization under METI, and R&D of AD and convoy driving technologies were a part of the project. Considering that AD had previously rarely been budgeted as a stand-alone project, the current generous public expenses for the topic indicate the highest expectation of AD in the government ever.

## 4 Conclusion

In Japan, over the past two decades, a mechanism has been established whereby policy areas of importance to the Cabinet have been discussed in policy conferences. As evidenced by its inclusion in several policy conferences, the topic of AD has received a great deal of attention within the government in recent years. The names of the policy conferences that formulated policy documents mentioning AD give an indication of the policy areas in which AD is being addressed in Japan—foremost, the economy. Having enjoyed a fair amount of popular legitimacy in the narrative of economic revitalization in the second Abe administration (2012–2020), even IT, and science, technology and innovation policies were promoted with expectations of their contribution to economic growth and productivity improvement, and AD has been linked to these policy areas. The withdrawal of public transportation in suburban and rural areas is discussed in part with the issue of an aging society and limited social and economic activities, which is seen as a stumbling block to future economic development, and in this context, AD is expected to be a solution to the declining working population and intra-society mobility. In this way, the AD policy reflects how policymakers interpret IT, science and technology, and mobility in relation to society, and what they expect from them.

The empirical evidence on AD-related policy processes in Japan suggests that the way the government engages in the economy through various policy areas, including science, technology, and innovation, is more orchestrating than mere coordinating. The overall orchestration by the government in policy areas that are expected to enhance economic growth is reinforced by specific measures such as the promotion of AD proposed by corporate members of the technology sector. In addition to the enduring close relationship between industrial members and the government, changes in the power relationships between the Cabinet, the National Diet, and ministries and agencies have made possible the recent rather top-down policy process through policy conferences. In AD policy, the weaker legislative and judicial branches have given rise to leadership by a core executive, such as the Prime Minister, relevant Ministers of State, and other politically-appointed officials. By assigning the function

of a command/control tower to the policy conferences and gathering more human resources and budgets to the Cabinet and the Cabinet Office, the strong, barely-opposed, leadership described as "*Kantei Ikkyō*" (one strong by the Prime Minister's Office) was established within the government under the Abe administration. In AD policy, such an institutional setting seems to facilitate the way of governance as an SME by reducing obstacles in the policy process for smooth policy formulation and implementation, even though ministries and agencies such as MLIT and NPA show reluctance to give up the last stronghold against deregulation.

Comparing the findings for Japan with a more general description of the German situation in this chapter indicates some significant differences between the two countries. First, AD policy and measures will be different because of varying views on how the government considers public transportation and what the government expects from scientific and technological innovations. In Germany, public transport services have been traditionally interpreted as elementary services of the public interest, and the public sector plays an important role in fulfilling its legal responsibilities in this area. In addition, German legislation mandates the incorporation of the principles of climate protection and sustainability into the provision of local public transport services. This view differs from that of the Japanese government, which has positioned public transportation as a for-profit business and, until recently, has not actively engaged in a legislative debate on the role of public transportation services and the public sector vis-à-vis society. As a result, these differences appear to affect governments' discussions on how AD should be integrated into the mobility sector, and the extent to which the governments will proactively intervene in such issues. Japanese policy seems to have a strong focus on enabling technical progress in this field. This can be seen, for instance, in that the new laws that enable Level 4 AD passed in both countries suggest its initial application in public transport. It is noteworthy that the Japanese government's motivation is strongly linked to its intention to realize a higher Level of AD technologies, even in a limited environment at first. At the same time, the German government also seems to be influencing the direction in which AD develops, with the intention of introducing it as a complement to the public transport network, and in this case at least, Germany is approaching a "state-influenced" governance style. Related to this point, the expectations of science and technology also differ to some extent between the two countries. In Germany, new scientific and technological innovations are expected to and should contribute to both economic welfare and environmental improvements. In a similar vein, in Japan, such innovations are expected to contribute to economic growth while solving social issues. In addition, however, scientific and technological independence, or technological superiority, has historically been a key concept in Japan to secure national (economic) security, regarding which policymakers share a strong sense of crisis amidst the economic stagnation of the past several decades. As a result, the state appears to intervene more directly in the coordination of scientific and technological innovation activities through state subsidies and investments in national projects to achieve

the national goals. Although AD is an important policy issue in both countries in terms of industrial competitiveness because of their thriving domestic auto industries, these differences in the contextualization and expectations of AD in science and technology policy would lead to differences in approaches to investing in national innovation activities based on different underlying motivations.

It is not only differences in their motivations that shape state actions. Differences in political institutional contexts further explain whether the state can exercise its power to impose policies with relative ease, or whether the socially-embedded mechanism requires more deliberative efforts among the various stakeholders. In Germany's post-war history, social movements have had a significant influence on shaping technological innovation discourse. The ecological movements since the 1980s elevated environmental issues to a key policy agenda that policymakers can no longer ignore. Citizen participation in policy formation through the formal policy process and the public sphere, and the sensitivity of politicians to citizen input, are the result of this history and enduring attempts to enhance social and democratic legitimacy. Accordingly, the German government tends to play the role of mediator in social negotiations by enabling exchanges among citizens, science, and industry. The survey results presented in chapter "Social Acceptance of CAD in Japan and Germany: Conceptual Issues and Empirical Insights" suggest the comparatively high willingness of the German public for involvement in planning and conducting AD field trials, which may be an indication of their interest in the governance of emerging technologies in the pre-market stage. Furthermore, German policymakers are required to formulate relevant policies at multi-levels of governance—at the European, national, and local levels. Responsibility for the planning, organization, and financing of local public transport is decentralized, and the Federal Government needs to function as a policy moderator between the European Union and regional/local communities.

As in Japan, the German technology sector, especially the automotive industry, has a close relationship with the government and channels to influence the policy direction of AD. Yet, perhaps in Japan, as long as the industry proposals support the government's overall leadership in science and technology development, the players may be able to influence policy in a more overt and visible way, as evidenced by industry participation in policy conferences. In addition, in Japan, civil society is hardly represented in AD-related policy processes when looking at members of relevant policy conferences. Government actions seem to be largely legitimated by democratic electoral-based state legitimacy, in which economic policy has been a key election issue for many years. Having enjoyed a fair amount of popular legitimacy in the narrative of economic revival, the second Abe administration (2012–2020), together with industry, successfully linked AD to the expected positive consequences of national competitiveness and productivity improvement. While citizens seldom show doubt about the paternalistic leadership role of the government in economic growth, the government expects the general public to improve their knowledge and understanding of the use of AD through communication activities and, in turn,

become responsible consumers/users of new products and services. Such political institutions and governance modes may mean that, compared to Germany, Japan can promote AD policies relatively smoothly through means such as investment in national projects and modification of the legal framework in the name of governmental leadership supported by citizens and industry. Therefore, if future cabinets continue to place AD at the center of their policy interests, the introduction of automated vehicles to the market may even be realized sooner than in other countries. However, just as the privatization of public transportation has led to a rapid decline in services in rural and suburban areas, the economic-oriented promotion of AD will not necessarily guarantee a sustainable public transportation system. On the other hand, Germany is ahead of other countries in legal amendments related to AD. However, policymakers are required to play a role in the multi-level governance participated by diverse stakeholders, and the social implementation of AD will proceed through a responsible governance approach, which does not promise the speedy realization of AD in German society. Nevertheless, for a country seeking to achieve public value by enhancing the democratic legitimacy of its policy decisions in the future sociotechnical system, this approach may be a shorter path to this end.

In this chapter, we put the focus on a detailed analysis of the Japanese situation in the context of the governance of AD. On a more general level, we made some comparisons with the situation in Germany. On that basis, the analysis in this chapter indicates that the broader settings of technology governance, here framed as politics, polity, and policy, may well have a significant influence on the future development of AD. Automated vehicles come with an immense transformative potential for the entire mobility sector [5, 44]. To allow effective and efficient governance in a complex field such as mobility, we need a good understanding of all factors that may influence future development pathways. Further research should take up these findings and undertake more comparative analyses between countries that have the potential to play a leading role in future governance and implementation of AD.

## Appendix

**Table 1** Japanese policy conferences, ministries and agencies that have published policy documents mentioning automated driving (AD) between 2012 and 2020

| Policy conference/Ministry and agency | Member of conference | Subordinate meeting body engaged in draft writing | Member of meeting body | Name of policy document that mentions automated driving (AD) |
|---|---|---|---|---|
| Headquarters for Japan's Economic Revitalization (2012–2020 in the Cabinet)<br>Committee on the Growth Strategy (since 2020 under the Cabinet) | Head: PM<br>Acting head: Deputy PM/MoF<br>Deputy head: CCS; MoSEF<br>Member: other Ministers<br>(as of 16.09.2020) | Council on Investments for the Future | Head: PM<br>Acting head: Deputy PM/MoF<br>Deputy head: CCS; MoETI; MoSEF<br>Member: MoECSST; MoIAC; MoSRR;<br>MoSSTP;<br>5 from business field (DeNA, Future Corp.; Japan Business Federation; Nissan; Sompo Holdings, etc.);<br>2 from univ.<br>(as of 05.10.2018) | Growth Strategy (2013), revised and published every year |
| Council on Overcoming Population Decline and Vitalizing Local Economy (since 2014 under the Cabinet) | Head: PM<br>Deputy head: CCS<br>Member: other Ministers;<br>4 from business field (East Japan Railway Company, etc.);<br>3 from univ.;<br>3 from other fields<br>(as of 01.05.2020) | | | Basic Policy for Overcoming Population Decline and Vitalizing Local Economy (2015), revised and published every year |

(continued)

**Table 1** (continued)

| Policy conference/Ministry and agency | Member of conference | Subordinate meeting body engaged in draft writing | Member of meeting body | Name of policy document that mentions automated driving (AD) |
|---|---|---|---|---|
| Integrated Innovation Strategy Promotion Council (since 2018 under the Cabinet) | Head: CCS<br>Acting head: MoSSTP<br>Deputy head: MoITP; MoSHP; MoSIPS; MoSOP; MoSSP<br>Member: other Ministers<br>(as of 25.07.2018) | | | Integrated Innovation Strategy (2018), revised and published every year |
| IT Strategy Headquarters (since 2001 in the Cabinet) | Head: PM<br>Deputy head: CCS; MoETI; MoIAC; MoITP<br>Member: other Ministers; Government CIO;<br>6 from business field (Japan Business Federation; NTT; Preferred Networks; Rakuten, etc.);<br>3 from univ.;<br>1 from other fields<br>(as of 19.12.2018) | IT Strategy Drafting Committee | Chairman: Government CIO<br>Member: 7 from business field (Future Corp.; NTT; Toyota, etc.);<br>1 from univ.;<br>1 from other fields<br>(as of 09.05.2013) | Declaration to be the World's Most Advanced IT Nation (2013), revised and published every year until 2016 |
| | | Executive Committee of Basic Act on the Advancement of Public and Private Sector Data Utilization | Chairperson: Prof. from univ.<br>Member: 7 from business field (Hitachi; NTT Data; Rakuten; Toyota, etc.);<br>6 from univ.;<br>4 from other fields;<br>Government officials from different ministries and agencies<br>(as of 04.04.2017) | Declaration to Be the World's Most Advanced IT Nation<br>Basic Plan for the Advancement of Public and Private Sector Data Utilization (2017), revised and published every year until 2020 |

(continued)

**Table 1** (continued)

| Policy conference/Ministry and agency | Member of conference | Subordinate meeting body engaged in draft writing | Member of meeting body | Name of policy document that mentions automated driving (AD) |
|---|---|---|---|---|
| | | Road Traffic Working Group | Chairperson: Prof. from univ.<br>Member: 4 from business field (DeNA; Hitachi Automotive Systems; Japan Automobile Manufacturers Association; Toyota);<br>2 from univ.;<br>3 from other fields;<br>Government officials from different ministries and agencies<br>(as of 05.12.2018) | Public–Private ITS Initiative/ Roadmaps (2014), revised and published every year |
| | | Sub-Working Group for the Charter for Improvement of Legal System and Environment for Automated Driving Systems | Chairperson: Prof. from univ<br>Member: 4 from business field (DeNA; Hitachi Automotive Systems; Japan Automobile Manufacturers Association; Toyota);<br>5 from univ.;<br>3 from other fields;<br>Government officials from different ministries and agencies<br>(as of 07.11.2018) | Charter for Improvement of Legal System and Environment for Automated Driving Systems (2018) |

(continued)

**Table 1** (continued)

| Policy conference/Ministry and agency | Member of conference | Subordinate meeting body engaged in draft writing | Member of meeting body | Name of policy document that mentions automated driving (AD) |
|---|---|---|---|---|
| Council for Science, Technology and Innovation (since 2014 in the Cabinet Office) | Head: PM<br>Member: CCS; MoECSST; MoETI; MoF; MoIAC; MoSSTP; Science Council of Japan;<br>3 from business field (Toyota, etc.);<br>4 from univ.<br>(as of 28.02.2018) | Study group on how to promote fundamental technologies | Member: Science Council of Japan; 7 from business field (Council on Competitiveness-Nippon; Hitachi; Toyota, etc.);<br>14 from univ.<br>(04.09.2015) | The Science and Technology Basic Plan, revised and published every five year |
| | | SIP-adus Steering Committee | Program Director: Toyota<br>Deputy Program Director: Nissan; Honda; Japan Science and Technology Agency; Prof. from univ.<br>Member: 6 from business field (Honda; Japan Auto Parts Industries Association; Japan Automobile Standards Internationalization Center; Japan Electronics and Information Technology Industries Association; Japan Federation of Hire-Taxi Associations; Suzuki, etc.);<br>5 from univ.;<br>3 from other fields;<br>Government officials from different ministries and agencies<br>(as of 05.06.2019) | R&D Plan for SIP-adus (2014), revised and published every year |

(continued)

**Table 1** (continued)

| Policy conference/Ministry and agency | Member of conference | Subordinate meeting body engaged in draft writing | Member of meeting body | Name of policy document that mentions automated driving (AD) |
|---|---|---|---|---|
| Ministry of Economy, Trade and Industry;<br>Ministry of Land, Infrastructure, Transport and Tourism | | Panel on Business Strategies for Automated Driving | Chairperson: Prof. from univ.<br>Member: 14 from business field (Toyota; Nissan; Honda; Isuzu; Hino; Denso; Jtect; Renesas electronics; Hitachi Automotive Systems; Panasonic, etc.);<br>5 from univ.;<br>3 from other fields<br>(as of 31.03.2020) | "Action Plan for realizing the Automated Driving" Version 4.0 by Panel on Business Strategies for Automated Driving (2016), revised and published every year |
| National Police Agency | | Research and Study Committee for the Realization of Automated Driving | Member: 1 from business field (Japan Automobile Manufacturers Association);<br>9 from univ.;<br>2 from other fields;<br>Government officials from National Police Agency<br>(as of 06.11.2020) | Report on Research and Studies for the Realization of Automated Driving (2020), revised and published every year |

*Note* Document name in bold means that the document was brought up and approved in a Cabinet meeting
List of abbreviations:
**CCS**: Chief Cabinet Secretary
**MoECSST**: Minister of Education, Culture, Sports, Science and Technology
**MoETI**: Minister of Economy, Trade and Industry
**MoF**: Minister of Finance
**MoIAC**: Minister of Internal Affairs and Communications
**MoITP**: Minister in charge of Information Technology Policy
**MoSEF**: Minister of State for Economic and Fiscal Policy
**MoSHP**: Minister of State for Healthcare Policy
**MoSIPS**: Minister of State for the Intellectual Property Strategy
**MoSOP**: Minister of State for Ocean Policy
**MoSRR**: Minister of State for Regulatory Reform
**MoSSP**: Minister of State for Space Policy
**MoSSTP**: Minister of State for Science and Technology Policy
**PM**: Prime Minister
**Univ.**: university or research institute

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