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16. Abstract This synthesis paper describes the information exchange between the US Federal Highway Administration (FHWA) and the Australian National Transport Commission (NTC), focusing on the period between its beginning in 2010 through 2015. The purpose of this synthesis paper is to summarize the information exchange, examine the benefits of the exchange, articulate challenges that arose during the exchange, and recommend next steps and options.			
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Executive Summary

This synthesis paper describes the information exchange between the US Federal Highway Administration (FHWA) and the Australian National Transport Commission (NTC), focusing on the period between its beginning in 2010 through 2015. The purpose of this synthesis paper is to summarize the information exchange, examine the benefits of the exchange, articulate challenges that arose during the exchange, and recommend next steps and options.

The FHWA-NTC information exchange emerged from mutual interest between the U.S. and Australia in learning federal transportation lessons from countries with similar needs and transportation systems. The formal information exchange began in 2010, though there had been ad hoc exchanges going back many years previously, and primarily constituted a series of webinars attended by employees of both agencies and representatives of related stakeholders. Webinar topics were chosen collaboratively by both countries, based on input from various offices and individuals within the respective organizations. For a variety of reasons, most webinar topics were freight-related. Of the 25 webinars held between 2010 and 2015, 21 were focused primarily on freight transportation topics. Because of the focus on freight, the paper provides a summary of the state of practice in freight management, which gives the state of practice in the two countries on the following topics: federal guidance to states, oversize/overweight permitting, performance measurement, safety and compliance, multimodal issues, finance, public-private partnerships, and weight-distance taxes.

The paper provides a summary of all 25 webinars held in the information exchange, grouping the webinars into the following topic areas: Data Collection and Analysis, Multimodal Freight, Road Freight Productivity Initiatives, Road User Charging, Safety, Strategic Policy, Technology, and Environment.

The paper presents six benefits of the information exchange:

- Increased information basis for policy discussions.
- Technology transfer.
- Formation of key contacts.
- Exposure to international experts.
- Proof of policy success.
- Critique by foreign experts.

It also presents four challenges faced by the information exchange:

- Differences in geography, economy, and governmental structure between the two countries sometimes made the policy issues more difficult to understand.
- It was sometimes difficult to determine how lessons from one country could be applied to the other country.
- It was sometimes difficult to articulate the benefits of a given webinar in advance.
- Webinar logistics, including time zones differences, sometimes proved challenging.

Finally, the paper presents one opportunity for the information exchange: greater use of in-person meetings and exploring the possibility of personnel exchanges. This paper recommends continuing the information exchange. This paper recommends that in the future, the exchange should shift somewhat in subject matter focus to expand beyond freight-related topics. The information exchange can have a broader focus, and feature additional topics including infrastructure for connected and autonomous vehicles, and revenue generation and alternative finance. In addition to having broader subject matter, the information exchange can also feature

a more refined method of determining the topic of each information exchange webinar. Specifically, each webinar should be planned with benefits in mind, and should be selected using a more formal process. This paper also recommends that the information exchange expand to include more in-person meetings and explore personnel exchanges.

1. Introduction

This synthesis paper describes the information exchange between the US Federal Highway Administration (FHWA) and the Australian National Transport Commission (NTC) focusing on the period between 2010 and 2015, which primarily constituted a series of webinars attended by employees of both agencies and representatives of related stakeholders. This paper summarizes the information exchange, examines the benefits of the exchange, and articulates challenges that arose during the exchange. Looking forward, this synthesis paper recommends continued exchanges; however, the exchange should shift somewhat both in subject matter focus and in methodology for determining the topic of each information exchange webinar.

Section 2 details the background of the information exchange, including how it began and how topics for the webinars were selected. The most prominent focus area of the webinar series was freight. In light of that, this section also provides a summary of the freight management state of practice in both the U.S. and Australia.

Section 3 provides summaries of all of the information exchange webinars held between 2010 and 2015, organized by topic area.

Section 4 lists benefits, challenges, and opportunities of the information exchange.

Section 5 gives recommendations and next steps for the partnership, based on the information presented in the first four sections of this document.

2. Background of the FHWA-NTC Information Exchange

This section discusses the emergence of the US Federal Highway Administration (FHWA) and the Australian National Transport Commission (NTC) information exchange, including personnel exchanges that occurred early in the program, where staff from FHWA worked for a brief period of time on-site at NTC (or vice versa). It describes the way organizers selected webinar topics, including the emergence of freight as the dominant topic for the information exchanges. Because freight was the dominant topic, this section concludes with a survey of the state of practice of freight management in both the U.S. and Australia.

2.1 Emergence of the Information Exchange

The FHWA-NTC information exchange emerged from mutual interest between the U.S. and Australia in learning federal transportation lessons from countries with similar needs and transportation systems. In 2009, the NTC reached out to FHWA, requesting an introductory meeting during the 2010 annual Transportation Research Board (TRB) meeting with a representative from FHWA's Office of Freight Operations. As an outcome of that TRB meeting, both FHWA and NTC expressed interest in establishing a professional relationship and an on-going information sharing program with each other.

In 2010, then-CEO of the NTC, Nick Dimopoulos, came to Washington, DC to meet with then-Executive Director of FHWA, Jeff Paniati, to explore opportunities for mutual collaboration. They agreed the two countries could learn much from each other's federal transportation programs, and the meeting concluded with a commitment by both sides to explore the possibilities for an ongoing exchange of information.

Following Director Paniati's meeting with CEO Dimopoulos, FHWA's Office of International Programs staff began exploring possibilities for information and personnel exchanges with Jerome Carslake, who held an equivalent position at NTC. Shortly thereafter, in late 2010, a webinar information exchange series began. The two sides also began work on formalizing the relationship in an Implementing Arrangement (IA) that both parties signed in 2014. In addition to the webinar series, the IA established a framework for personnel exchanges and other activities in the course of the information exchange.

One major in-person meeting occurred early in the agreement, before the IA was signed. FHWA's Tom Kearney spent two weeks at NTC headquarters in 2011. During that time, he helped move the information exchange agreement forward, he established personal contacts, and he researched a range of specific topics that would later appear in the webinar series. Later in the program, several Australian representatives visited FHWA for similar purposes. These in-person meetings aided in establishing working interpersonal relationships, understanding the fundamental differences between the two countries and systems of government, and giving both sides a deeper understanding of specific topics. However, budget and schedule constraints limited the frequency and duration of these in-person meetings.

The primary feature of the information exchange was the webinar series, the main subject of this synthesis paper.

2.2 Selecting Webinar Topics

FHWA and NTC employed a collaborative approach to selecting topics for the webinar series. To the extent possible, organizers chose topics of interest to both parties, or in which one party possessed expertise and the other party was interested in learning. The webinar series targeted

six webinars per year (one every two months). In practice, FHWA and NTC conducted four or five webinars per year due to schedule constraints. In general, NTC and FHWA each suggested half of the topics for each webinar series. For both NTC and FHWA, the representative for the webinar series for each organization determined several topics to suggest by soliciting input from various internal offices that actively participated in the webinar series. After gathering the topics to suggest from their internal sources, the two representatives shared the topics with each other and selected those of greatest interest to both parties.

The IA signed in 2014 outlined four specific areas of collaboration: freight and related matters, environment, innovative financing, and technological innovations. However, the webinar series focused primarily on freight-related topics, even if they touched on the environment or technological innovations. Indeed, of 25 webinars held between 2010 and 2015, 21 focused primarily on freight-related issues, and only four focused on general transportation topics. The focus on freight was due to a number of reasons. Non-freight highway issues in Australia are frequently handled at the state level, so the main areas of activity for NTC are freight-related. In addition, there was a strong interest in Australian freight-related topics in Australia at the FHWA's Office of Freight Operations and in the Federal Motor Carrier Safety Administration (FMCSA); and there were many freight-related topics upon which the two sides discovered they could learn a lot from one another. However, the focus on freight-related topics was never meant to be exclusionary. In fact, there were two webinars on technological innovations (which focused on Cooperative Intelligent Transportation Systems) and two on innovative finance (which focused on P3s) that did not explicitly focus on freight. The remaining topic outlined in the IA, environment, featured one webinar in the series—but that one webinar focused on environmental impacts of freight movement.

2.3 Freight Management: State of Practice

As described above, freight was the dominant topic throughout the information exchange. A more complete understanding of the impacts and benefits of the information exchange requires background and context on the state of freight management in both countries. This section provides the state of practice of freight management at the federal level in both the U.S. and Australia. It specifically provides the state of practice in the following areas:

- Federal guidance to states
- Oversize/overweight permitting
- Freight performance standards supporting industry flexibility
- Safety and compliance
- Multimodal issues
- Finance
- P3s
- Road user charging / Weight-distance taxes

2.3.1 Freight Management: State of Practice in the U.S.

In the U.S., planning, construction, operation, and management of surface freight infrastructure is largely the responsibility of individual states. At the same time, a majority of funding for construction and maintenance of key freight corridors is provided by the federal government. U.S. states have significant power to regulate surface freight movement within their borders, as well as to manage freight facilities. The federal role has focused on issues of regulating interstate commerce, particularly safety. Outside of regulating safety-related activities, federal agencies historically have focused on data collection, research, disseminating best practices to

states, and technology transfer to states. In recent years, the legislation authorizing federal spending on surface transportation has included increasing requirements for states to formalize their corridor planning and freight performance management activities. These are discussed below.

Federal Guidance to States. In the Moving Ahead for Progress in the 21st Century Act (MAP-21), enacted in 2012, the U.S. federal government placed increased emphasis on asset management, performance measurement, and coordinated planning. MAP-21 included provisions that require FHWA to “encourage” states to create state freight plans and state-level freight advisory committees. Under the more recent Fixing America’s Surface Transportation (FAST) Act, State Freight Plans are a requirement for receiving federal funding under the National Highway Freight Program. These state-level plans must detail short- and long-term planning and investment in freight infrastructure. State Freight Plans are multimodal in nature. The federal government’s role in developing State Freight Plans is limited to guidance and providing data (especially data on truck travel speeds on the interstate highway system).

Oversize/Overweight Permitting. By statute, the federal government limits the maximum size and weight of trucks on the interstate highway system, but does not issue oversize or overweight permits. That authority rests with individual states, which may issue oversize/overweight permits for travel within the state. Such permits are typically issued by the divisions of state transportation departments, law enforcement, or other agencies focused on regulation of commercial vehicles within the state. In most instances, the cost of an oversize/overweight permit is pegged to administrative cost recovery, not the cost of moving the load on the transport system (maintenance/repairs/congestion).

Freight Performance Standards Supporting Industry Flexibility. Beginning with MAP-21, the federal government established specific performance measurement requirements on states as a condition for including them in the federal aid highway program. These measures are intended to support all surface transportation planning, including developing state freight plans and potentially establishing performance standards. Federal freight performance measurement activities have tended to focus on providing data to states for their own analysis.

A key challenge facing all levels of government in the U.S. has been hesitation on the part of the trucking industry to share what it considers commercially confidential information. Such information could be helpful for developing freight performance measures, and for conducting broader freight-related research. To help overcome this reluctance, the American Transportation Research Institute (ATRI¹), the research arm of the American Trucking Associations, has produced the Freight Performance Measures initiative as a main part of their research. This initiative is a cooperative effort of ATRI and FHWA to develop numerous performance measures for the nation’s highway system. A main product of this initiative is FPMWeb², an online tool that allows qualified researchers to access data on average truck speeds on interstate highway segments.

Safety and Compliance. Safety has been a primary focus of federal regulation and enforcement. However, federal rules generally only apply to motor carriers engaged in interstate commerce. States also have the right to regulate industry. In practice, most states incorporate federal regulations on safety, hours of service, and hazardous materials into their own requirements. Compliance with federal safety standards has generally been based on manual record-keeping (particularly for monitoring compliance with regulations on hours of service), roadside inspections, crash reports, and on-road equipment and moving violation enforcement.

¹ <http://atri-online.org/>

² <https://www.freightperformance.com/>

FMCSA maintains a Safety Measurement System and develops metrics from the sources listed above. A recently instituted regulation requires most interstate carriers to install Electronic Logging Devices (ELD) on heavy vehicles not later than December 18, 2017. ELDs will replace manual hours of service records.

Multimodal Issues. One of FHWA's main priorities is to ensure that freeway corridors support continuous movement of multimodal freight throughout the country. FHWA's Office of Freight Management and Operations researches and provides strategic guidance to states on multimodal freight issues at seaports, airports, and inland truck / rail multimodal facilities.

One area where the FHWA has played a relatively larger role than the states is in funding and providing data to support freight movement optimization through both sea and land U.S. ports of entry. FHWA's role is particularly important since activities at both sea and land ports of entry are monitored by multiple federal agencies (Customs and Border Protection, Immigration and Customs Enforcement, US Coast Guard and others) and state agencies. FHWA is a member of both the US-Canada Transportation Border Working Group and the US-Mexico Joint Working Committee on Transportation Planning, both of which work to identify border infrastructure planning needs and to find ways to optimize cross-border freight flows.

Finance. Surface freight typically moves on general purpose corridors, which are funded through a variety of mechanisms. In the U.S., each state or territory assesses a motor fuel excise tax, and some also assess motor fuel sales taxes.³ The state fuel tax rate varies from state to state. In addition, motor fuels sold in the U.S. are subject (with limited exceptions) to a federal excise tax. Federal excise taxes are deposited in the National Highway Trust Fund, which is limited to highway-related uses, with a small portion reserved for public transit capital investment. Many states dedicate their excise tax revenues to transportation uses, but diversion to other uses has been a growing issue in recent decades. Neither state nor federal diesel excise tax revenues are dedicated to "freight" infrastructure. Because most freight travels on general purpose lanes, revenues from excise taxes go to projects that benefit both freight and general purpose traffic.

The International Fuel Tax Agreement (IFTA) is not a revenue-generating mechanism, but plays an important role in allocating state fuel excise taxes paid by heavy vehicles engaged in interstate commerce. Because each state levies its own motor fuel excise and has the authority to regulate licensing within its borders, trucks operating in multiple states were subject to reporting, audit, and inspection in any jurisdiction in which they operate. A single carrier could be required to report to as many as 58 different jurisdictions between the U.S. and Canada. IFTA established a base agreement among the states to collect and distribute fuel use taxes across jurisdictions. The agreement dramatically reduces industry's reporting requirements and government's audit costs.

Public Private Partnerships (P3s). In the last two decades, state agencies across the U.S. have leveraged P3s for large infrastructure projects. Although P3s are common elsewhere in the world, they are still considered a novel approach in the U.S. The relative novelty of P3s in the U.S. is in part because P3s law exists primarily at the state level, which means that 50 distinct jurisdictions need to generate such a body of mature law. Despite the relative novelty of the approach, in transportation, P3s have been employed in airports, seaports, and intermodal facilities. As a mechanism for financing surface transportation, P3s have been leveraged to

³ There are various permutations of the sales tax, through all levels of government from state to county to city. For simplicity, these are not considered here.

construct toll roads and toll express lanes. States with the most mature markets for surface transportation P3s include Florida, Texas, and Virginia.

Road User Charging / Weight-Distance Taxes. The federal government does not assess any sort of weight-distance tax, but states have the authority to do so. Four have weight-distance taxes in place (Kentucky, New Mexico, New York, and Oregon). In the past, reporting for these taxes was paper-based, but with growing ELD adoption, states like Oregon are shifting to automated reporting.

2.3.2 Freight Management: State of Practice in Australia

As in the U.S., in Australia, planning, constructing, operating, and managing surface freight infrastructure is largely the responsibility of individual states. Australian states collect vehicle registration fees, a major source of roadway funding, themselves. Australian states have near total power to regulate surface freight movement within their borders, as well as to manage freight facilities. The federal role in Australia has been limited to providing guidance to the states, as well as making efforts to coordinate activities among the states, including sponsoring research.

Federal Guidance to States. At the Australian federal level, Infrastructure Australia and the Department of Infrastructure and Regional Development (Australian Federal/Commonwealth level) provide strategic guidance to states on developing priority corridor investments for freight. Infrastructure Australia also provides economic and strategic evaluation for project proposals to advise the Commonwealth (Australian federal) Government on the merits and prioritization of projects submitted by the states. Infrastructure Australia is increasingly interested in using aggregate data supplied by telematics systems to inform infrastructure planning, particularly for network maintenance. Key issues for telematics systems include protecting commercially confidential data and creating common data formats to allow easier data aggregation.

Oversize/Overweight Permitting. Each Australian state has distinct procedures for issuing permits for oversize and overmass vehicles. Some require permits either for vehicles that exceed overall size and mass limits, or for vehicles that exceed lower size and mass limits on specific roads. To get a permit, oversize and overmass vehicle drivers must declare their loads and specify the route they plan to drive so road managers (state and local authorities) can identify if there are any infrastructural, safety, or other risks to address beyond a vehicle escort. Some types of vehicles and loads require additional permits. In issuing permits, restrictions on time of day or date of travel may be imposed, particularly to avoid times of heavy seasonal congestion. Permit fees are set, at a minimum, to recover the administrative costs of issuing the permit and monitoring costs. Permit fees may also include contributions toward the additional marginal infrastructure costs imposed by the oversize or overmass vehicle.

Freight Performance Standards Supporting Industry Flexibility. Australia developed a National Heavy Vehicle Accreditation Scheme, which seeks to incentivize road freight operators to meet high standards of operation, particularly safety compliance. The key incentive is enabling highly compliant operators to minimize the number of compliance inspections, so costs are reduced and enforcement activities are focused on other operators. The NTC also developed a Performance-based Standards approach to encourage vehicle manufacturers and other parties to enhance vehicle productivity through innovative vehicle design and configurations.

Safety and Compliance. The National Heavy Vehicle Regulator (NHVR) administers and enforces the National Heavy Vehicle Law (NHVL). The NHVL was developed by the NTC and provides a single set of rules and framework for compliance and enforcement across all Australian states and territories. Most states and territories have now adopted the NHVL and

have effectively transferred their heavy vehicle safety regulation to the NHVR. The NTC continues to maintain the law to ensure its ongoing effectiveness. The NHVR is developing a National Compliance Information System to amalgamate data from states and territories to improve understanding of non-compliance patterns and assist in developing compliance strategies across the country. It is also developing industry codes of practice to identify, manage, and mitigate risks to help operators meet obligations under the National Heavy Vehicle Law.

The National Heavy Vehicle Laws provide for drivers to use an Electronic Work Diary (EWD). EWDs are essentially the same as ELDs in the U.S. context. EWDs are not mandatory, but are intended as a voluntary alternative to written work diaries. EWDs are intended to reduce compliance costs for operators, while allowing for consistent monitoring of driving hours and immediate responses to driving-hour violations. The NHVR is currently developing the standards/specifications for EWDs which will enable them to consider approving the use of EWDs in the future.

Multimodal Issues. The NTC seeks to encourage multimodal industry collaboration, co-operation and co-ordination to optimize supply chains, while ensuring that competition between port, rail, and road transport operators remains vigorous. The NTC encourages collecting and distributing aggregate data so each infrastructure provider (port companies, railway infrastructure and highway agencies) and service providers (shipping companies, rail freight operators, and road freight operators) are able to better respond to demand and infrastructure issues.

Finance. The main sources of road related government revenues are fuel taxes and vehicle registration fees.

The fuel tax in Australia is levied at the federal level only. Fuel tax revenues are treated as general tax revenue by the Commonwealth Government (not earmarked for transportation or any other uses). However, although there is no precise earmark, there are strong recommendations to use fuel tax money for transport needs. Every year the NTC makes recommendations to the level of what is called the "Road User Charge," based on a cost allocation calculation of past spending on roads that can be attributed to heavy vehicles. The "Road User Charge" is the proportion of fuel tax that heavy vehicle⁴ owners pay that is the *usage* related element of road costs (covering maintenance and capital spending on all public roads in Australia).

Registration fees are collected at the state level only, but along with the diesel "Road User Charge," registration fees for heavy vehicles are also agreed and coordinated based on NTC recommendations. The NTC applies the same cost allocation calculation to develop registration fee levels that vary by vehicle size, mass and configuration.

Public Private Partnerships (P3s). States and local authorities in Australia decide how to use funds from P3s and tolls. Three states currently use P3s and tolls to fully or partially finance road projects: New South Wales, Queensland and Victoria. The decision of whether to toll a given project is typically based on whether tolling is able to raise a significant proportion of the capital costs of the project over a reasonable concession period (e.g. 20 to 30 years), the impact tolling would have on the economic benefits of the project (including impacts on parallel routes), and the technical feasibility of tolling the route. Because of this, only select, very large road projects have been financed with P3s.

⁴ Heavy vehicles are defined as having a gross vehicle weight of 4.5 tonnes (US 4.96 tons).

Australian P3s typically use the Design Build Finance Operate model of concessions for periods of between 20 and 35 years, with the right to toll the road. Tolls are subject to a cap on increases, based on inflation. Tolls are mostly used by P3s on new highways and crossings, although both the existing Melbourne CityLink project and the under-construction M4/M5 WestConnex project in Sydney feature tolls on portions of already-existing, previously/currently-free roadways. Both of these projects included upgrading existing roadways and construction of significant new highway segments, in addition to adding tolls to existing infrastructure.

Road User Charging / Weight Distance Taxes. For some years, Australia has been investigating options for heavy vehicle road user charging, which may ultimately be comparable with weight-distance taxes, to encourage better infrastructure cost recovery from heavy vehicles and to enable the road network to be funded to improve freight productivity.

Australia is embarking on a program, called Heavy Vehicle Road Reform (HVRR), to reform charging and funding road use for heavy vehicles. The HVRR project aims to create a market for the provision and use of heavy vehicle infrastructure, with better alignment between the needs of users, the charges they pay and the services they receive. The HVRR road map identifies four incremental phases to progressing heavy vehicle investment and charging arrangements:

1. Improve transparency of investment, expenditure and service delivery
2. Implement forward looking cost base and independent price regulation
3. Return charges revenue to road owners based on use, and
4. Implement more direct user charging where appropriate.

The road map prioritizes supply side reform measures in progressing reform, with charging reforms only considered later.

All states are committed to implementing these reforms, with the priorities being to establish a level of spending on the road network to meet the needs of heavy vehicles and to transfer responsibility for setting charges from state and commonwealth governments to an independent price regulator.

3. Summary of Information Exchange Webinars

This section presents summaries of the 25 information exchange webinars held between 2010 and 2015. The 25 webinars are organized into eight categories.

3.1 Data Collection and Analysis

In the two webinars on Data Collection and Analysis, various U.S. organizations presented how the U.S. measures important freight values. These webinars provided successful examples of large-scale, nationwide data collection to the Australian team, which was useful because in Australia data is generally collected at the state level.

3.1.1 Measuring Freight Value

In this webinar, held in August 2015, the U.S. Bureau of Transportation Statistics (BTS) provided an overview of how the U.S. measures freight volume data. BTS described how it surveys data for freight, including freight classification, and in what volumes. BTS further presented data on freight movements—where, when, and how they typically take place. In the U.S., records of freight data movements are stored in Origin/Destination (and network freight movement databases. These databases store summaries of modes, commodities, and network usage. BTS concluded the webinar with a description of the Commodity Flow Survey, a survey of freight data movers used to analyze trends, forecast demand, and anticipate possible infrastructure needs.

3.1.2 Truck Performance Measurement Data

In this webinar, held in March 2014, FHWA and the American Transportation Research Institute (ATRI) presented the means by which trucks and freight performance data are measured and collected in the U.S. FHWA presented the Freight Performance Measurement Program, which measures how much freight is moving, where, when, and how it is moving in the U.S. The Freight Performance Measurement Program functions primarily by data aggregation, taking a variety of data, primarily from industrial sources, and combining it into a single geographically-coded database. The data aggregated in the program includes average truck speeds, geographic truck movements by origin and industry type, responses to incidents, and travel time data. This database is used by public and private entities for operational and investment decisions.

ATRI discussed the data that are most important for the trucking industry in the United States, particularly truck average operating costs per hour and mile. ATRI explained that data collection affects competition and litigation issues. One way to collect these data more accurately and completely is to use a trusted third-party broker, possibly in a form of P3 arrangement.

3.2 Multimodal Freight

In the two webinars on Multimodal Freight, the U.S. and Australian sides presented on state-of-the-art activities in port operations in each country. These webinars were helpful to both parties, as both the U.S. and Australia face challenges in port operations, and both benefitted from learning the cutting-edge approaches taken in the other country.

3.2.1 Port Operations Part 1

In this webinar from March 2012, NTC presented their Ports Strategy, their strategy for handling a tripling of freight shipments to Australia in the next fifty years, including the near-term measures being taken to enhance freight transport productivity through 2030. The webinar presented the need for data collection as one of government's most important roles. Having accurate data is the basis to facilitate and inform approaches to enhancing productivity, which were expected to be led by industry. The webinar also described the International Port Study tour, a tour of major international ports undertaken by the Australians to get a deeper understanding of worldwide best practices. Ports toured included Valencia, Spain; Norfolk, Virginia; and LA/Long Beach, California.

3.2.2 Port Operations Part 2

In this webinar from April 2012, FHWA presented three freight mobility connected vehicle applications intended to improve port operations: Freight Real-time Traveler Information, Freight Dynamic Route Guidance, and Drayage Optimization. As the connected vehicle platform becomes operational, these applications will provide opportunities to avoid delays, maximize loaded truck movements, and minimize unloaded movements.

Next on the webinar agenda, the Gateway Cities Council of Governments (the metropolitan planning organization for the southeast Los Angeles region) presented how life and transportation in gateway cities are heavily impacted by freight movement. The L.A. region is managing environmental impacts and safety risks in a state of ever-growing demand for freight movements. The webinar included a discussion of the I-710 Corridor project, a technology plan for goods movement, planned railroad capacity improvements, and air quality strategies for ports and railroads.

3.3 Road Freight Productivity Initiatives

In the three webinars on multimodal freight, the U.S. and Australian sides presented road freight productivity initiatives to one another. The Australian side presented their work on B-triple trailers, and performance-based mass limits for heavy vehicles. These webinars were helpful to both parties, as both the U.S. and Australia face challenges in road freight, and both benefitted from learning the cutting-edge approaches taken in the other country.

3.3.1 Truck Parking

In this webinar from June 2013, several representatives from the U.S. side presented their information on a range of initiatives to improve truck parking. First, a representative of ATRI presented a survey on truck parking needs of U.S. truck drivers and a summary of Minnesota's "SmartPark4Trucks," a system that provides real-time truck parking facility occupancy. Second, FMCSA summarized their system demonstration to identify parking availability systems for heavy trucks in real time. Finally, FHWA presented studies it had done on truck parking, including truck stop and rest area locations, and a summary of funding programs to support truck parking facility expansions.

3.3.2 B-Triple Trailers

In this webinar from May 2013, NTC presented the use of B-triples in various Australian states, the variations of regulatory treatment between the states, and the emerging idea of having a modular national policy on B-triples, with key common parameters for safe configurations and operation in all states. While B-triples reduce number of vehicle trips (larger trucks mean fewer

trips), they have a larger impact on infrastructure for each trip, so the key policy driver for B-triple regulations is to reduce impacts on infrastructure while enhancing productivity.

3.3.3 Access to Performance Based Standards Mass Limits for Truck and Trailer Combinations

In this webinar from November 2015, the Australian side presented an overview of Performance-based Standards (PBS) in Australia (joint presentation from the NTC and the NHVR). PBS are increasing in importance in Australia, along with growing use of larger trucks on the network. The webinar included a list of vehicle combinations permitted on Australian highways. It covered the impacts of larger vehicles in reducing numbers of vehicles on the road, fuel savings, and improved safety risk. The webinar concluded with information on an upcoming review of the PBS marketplace (currently in progress) which set out to identify lessons learned about PBS, and describe the potential for future progress.

3.4 Road User Charging

In the four webinars on road user charging, the U.S. and Australian sides presented heavy vehicle road user charging initiatives to one another. The U.S. side presented studies on truck pricing and weight/size permitting. The Australian side presented their work on cost-recovery-based pricing, price-determination for heavy vehicle charges, and heavy vehicle road reform. These webinars were helpful to both parties, as both the U.S. and Australia are contemplating means by which they can update their sources of road funding, and both benefitted from learning the cutting-edge approaches taken in the other country.

3.4.1 Heavy Vehicle Charging and Investment Project

In this webinar from June 2012, NTC explained the origins and reasoning behind road pricing reform initiatives. In Australia, heavy vehicle charges are set nationally and are based on a cost recovery approach. However, the charges and institutional systems have led to distortions as there are disconnects between charge revenues and road funding.

NTC provided a description of the process in place to study a new heavy vehicle charge policy. Australia's key objectives with their heavy vehicle charging program are to improve charging efficiency and pursue demand-driven investment. The webinar also presented on the practicalities of reforming road pricing.

3.4.2 Price Determination and Heavy Vehicle Charges

In this webinar from May 2014, NTC presented the Australian Pay As You Go (PAYGO) system of setting heavy vehicle charges, including expenditure accountability. The webinar summarized Australia's equivalent standard axle approach to pavement wear contributions, including pavement wear contributions by heavy freight vehicles, light vehicles, and buses. The webinar illustrated the economic impacts of pricing structures through case studies of four heavy vehicle operators.

3.4.3 Heavy Vehicle Road Reform In Australia

In this webinar from November 2010, NTC explained their work on reforming heavy vehicle charges. The ultimate goal at the time was to introduce some form of mass-distance-location charging for trucks, which is seen as the way to most improve the productivity of the freight industry in the country. NTC presented pricing principles, network costs, pricing structure options, possible pricing rates, and the impact of pricing changes on behavior and the economic

impacts of those changes. The basic pricing principle is that heavy vehicle road charge prices should be set to recover costs and incentivize efficient road usage. Special consideration is given to pricing unusual vehicle configurations such as B-doubles and B-triples.

3.4.4 Truck Pricing

In this presentation from May 2015, several U.S. organizations (Battelle, Ohio DOT, and Compass Consulting) presented various truck pricing and permitting studies done in the U.S. Battelle presented on highway cost allocation studies across the U.S., including results of studies and key parameters. The presentation detailed an Idaho study outlining the negative revenue impacts of repealing the weight distance tax. Ohio DOT summarized a study on truck permits, including assessing heavy vehicles' economic impacts and how fees should seek to recover those costs. They presented a summary of state permit fees across the U.S. Compass presented on how mileage-based fees could be advanced for heavy trucks. Pricing for heavy vehicles has the advantages of privacy being less of a concern, and a lower overall cost to install because many trucks already have the required equipment. The presentation summarized the benefits of heavy vehicle charging for both trucking companies and for the public, and featured a summary of the New York Truck VMT Fee.

3.5 Safety

In the six webinars on safety, the U.S. and Australian sides presented heavy vehicle safety initiatives from each country to one another. The U.S. side presented studies on smart roadside enforcement, the Compliance, Safety and Accountability (CSA) program, and heavy vehicle inspection programs. The Australian side presented their work on driver alertness, performance-based specifications for heavy vehicle driver fatigue, and the National Heavy Vehicle Accreditation Scheme. These webinars provided useful information to both the FHWA and the NTC, as both organizations are dedicated to improving heavy vehicle safety in their home countries, and both organizations benefitted from learning the approaches to improving safety regulations being employed in the other country.

3.5.1 Smart Roadside Enforcement

In this webinar from October 2012, FHWA and FMCSA presented on connected vehicle technology to improve safety, mobility, and environmental outcomes through using data from greater vehicle-to-infrastructure connectivity for commercial vehicle enforcement. The priority applications presented by FHWA and FMCSA were:

- Wireless roadside inspections—automatic vehicle inspection from fixed infrastructure.
- E-Permit/virtual weigh station—automatic weight permitting from fixed infrastructure.
- Truck parking—over-the-air truck parking information and reservation system.
- Universal electronic truck identification—over-the-air identification system for all trucks.

FMCSA provided details on the Smart Roadside Initiative to identify and integrate truck-specific roadside infrastructure, including developing a concept of operations and subsequent testing for prototypes of the four smart roadside applications listed above.

3.5.2 National Heavy Vehicle Accreditation Scheme

In this webinar from August 2012, NTC presented the Australian heavy vehicle accreditation scheme that encourages Australian fleet operators to meet high standards of operation. The Australian scheme includes regular audits and is designed to minimize the number of

compliance stops their vehicles experience. The accreditation scheme is intended to reduce compliance costs and enable enforcement to focus on those most likely to be violators.

3.5.3 Compliance, Safety, and Accountability

In this webinar from February 2013, FMCSA presented on the CSA program, the U.S. heavy vehicle carrier accreditation scheme. CSA is intended to reduce accidents involving trucks and buses. CSA includes a safety measurement system, a database designed to enable better targeting of carriers in need of intervention that uses statistics on a range of behavior and safety improvement categories. The database provides automated warnings to FMCSA, allowing them to intervene where necessary and to determine why violations occur. CSA is a fundamentally more flexible approach to addressing safety than the traditional “inspect all vehicles at inspection stations” approach.

3.5.4 Driver Alertness

In this webinar from December 2014, Australian academics presented a summary of the Australian Co-operative Research Centre research on driver alertness, with its consequences on safety and productivity. The focus of the research was on predicting, preventing, detecting and intervening in alertness issues. The webinar included a review of fatigue detection technology and a methodology for analyzing sleepiness and driving.

3.5.5 Heavy Vehicle Maintenance and Inspections

In this webinar from October 2014, FMCSA and the Commercial Vehicle Safety Alliance (CVSA) provided a description of how vehicle maintenance is enforced in the U.S., including inspection procedures and technology. It described FMCSA roles and responsibilities and the CVSA. It outlined the Safety Management System approach for identifying high-risk carriers that need more enforcement attention, including screening enforcement at the roadside. It presented the impacts of the Safety Management System, including descriptions of crashes prevented and injuries and lives saved. This webinar was requested by the NTC who at the time were undertaking a review of Heavy Vehicle Roadworthiness practices and regulation in Australia.

3.5.6 Performance-based specifications for Heavy Vehicle Driver Fatigue

In this webinar from October 2010, NTC presented two topics on the way Australia manages and regulates heavy vehicle driver fatigue. First, NTC presented their ideas for improving the Basic Fatigue Management option, which is an option for heavy vehicle operators who wish to have some flexibility in hours-of-service (instead of being required to work normal business hours only). However, there were concerns that the Basic Fatigue Management options limit split rests too strictly, which forbade the ability to work a 14-day cycle and put too strict limitations on early starts. NTC discussed approaches to making it more flexible. NTC also presented Electronic Systems for Heavy Vehicle Driver Fatigue and Speed Compliance, which included technical considerations on an electronic work diary (similar to an ELD), as well as speed management equipment.

3.6 Strategic Policy

3.6.1 Status of National Regulators Initiative

In this webinar from May 2012, NTC presented a description of the national reform to establish a new Australian national heavy vehicle regulator. New regulatory and

operational/administrative arrangements were designed to bring greater harmonization of regulations and reduce compliance costs for operators. NTC explained the model legislation that needed to be accepted by the Australian states to create the regulator, a federal-level entity. Now created, the NHVR is a single contact point providing centralized business services and information to heavy vehicle owners, operators, and drivers. NHVR's goal is to lower compliance costs, ensure consistent understanding and application of laws, improve data collection and establish best practice across states. As a transitional arrangement, the NHVR has made service-level agreements with states and territories to provide services such as heavy vehicle registration and compliance and enforcement. The Heavy Vehicle national law promotes safety, productivity, and efficiency.

3.6.2 Infrastructure Australia P3 Lessons Learned

This webinar, from August 2012, was presented by Infrastructure Australia on behalf of NTC. Infrastructure Australia explained the P3 experience in Australia, which is more extensive than in the U.S., including highway P3s and other types of P3s.

3.6.3 National P3 Policy and Guidelines

This webinar, from April 2012, was presented by two U.S. attorneys familiar with P3 laws in various U.S. states. The attorneys discussed P3 initiatives in the U.S., as well as FHWA's national P3 policy and guidelines.

3.6.4 Heavy Vehicle Compliance—Towards a National Strategy

In this webinar from October 2012, NTC presented heavy vehicle compliance issues and approaches to heavy vehicle compliance in Australia. Increased compliance has a long-term record of reducing fatalities. Australia's objectives are to normalize compliance across the country and across industry sectors, and to apply a risk-based approach to compliance and enforcement practices. The webinar included assessing why non-compliance occurs, in particular targeting fatigue. The webinar also showed how intelligence around enforcement data can improve compliance.

3.7 Technology

3.7.1 Cooperative Intelligent Transportation Systems Policy

In this webinar from August 2013, the U.S. DOT's Intelligent Transportation Systems Joint Program Office (ITS-JPO) presented on the Connected Vehicle Policy Program, including program structure, milestones, surveys of drivers' attitudes on connected vehicles, piloted connected vehicle applications, and a discussion of the federal role in the connected vehicle program. The presentation included a discussion of infrastructure policy needs, privacy, and harmonization efforts.

3.7.2 Australia Cooperative Intelligent Transportation Systems Update

In this webinar from December 2013, several Australian bodies presented the cooperative ITS situation in Australia.

- Austroads presented on their strategic plan, policy, and regulation to facilitate ITS, including spectrum reservation for 5.9 GHz, the issue of four competing standards platforms, and their keenness to harmonize platforms. The presentation covered specific

issues with positioning and mapping. It included a summary of recent ITS trials and demonstrations in Australia.

- ITS Australia presented on the Australian vehicle market. The market is 85% imported, and is shaped by the highly urbanized Australian population. The group also presented the Australian National Policy Framework on ITS and summarized existing and planned ITS applications.
- Transport for New South Wales presented on the Cooperative Intelligent Transportation Initiative project. That project was intended to improve safety, increase network efficiency, and improve environmental outcomes. They described the Sydney to Port Kembla demonstration project, which aimed to improve safety.
- NTC presented a summary of the responses received to its discussion paper on cooperative ITS. The response included concerns about privacy, consistency with international approaches, impacts on vulnerable road users, possible increase of driver distraction, and the impacts of automation. NTC focused on liability issues.

3.7.3 Telematics

In this webinar from December 2010, NTC presented a detailed discussion of heavy vehicle telematics in Australia. Specifically, they discussed the wide range of benefits for government and industry from using in-vehicle telematics, and the fact that a national framework was needed to encourage greater use of in-vehicle telematics to accrue all possible benefits from it. This national framework should try to mitigate a range of concerns, such as cost, privacy, legal accountability, and uncertainty about benefits of the various telematics systems. Specific consideration was given to on-board mass-based telematics, which could be used to implement mass-based road usage charging.

3.8 Environment

3.8.1 Carbon Footprint Reductions In The U.S. Through Fuel Standards And SmartWay

In this webinar from February 2012, the U.S. Environmental Protection Agency presented a review of the SmartWay program, partners, and its activities on heavy vehicle carbon footprints. SmartWay certifies carriers (road and rail) for adoption of environmentally efficient measures. It enables shippers to make choices based on environmental performance and impact, based on measures taken to reduce fuel consumption. The webinar included a review of the U.S. approach to greenhouse gas standards across light and heavy vehicles, including expected net benefits and an approach to setting standard levels.

4. Information Exchange Benefits, Challenges, and Opportunities

This section discusses benefits, challenges, and opportunities associated with the information exchange. The information in this section was collected from discussions with information exchange participants from both countries. The section begins by describing the benefits information exchange participants observed. It then explores some of the challenges associated with the information exchange. It concludes with a discussion of opportunities to gain more benefits from the information exchange.

4.1 Benefits of the Information Exchange

Information exchange participants noted six main benefits:

1. **Increased information basis for policy discussions**—Many participants from both countries said that the information exchange webinars gave them a better understanding of the webinar topics' policy implications. Even if the exact topic covered in the webinar did not apply to the other country, the discussion provided valuable information for related policy topics.
2. **Technology transfer**—Participants from both countries said that they were better informed how technologies were being used worldwide—the interactive nature of the webinars provided participants a much more practical understanding of various technologies than simply reading about them in a periodical.
3. **Key contacts**—Participants from both countries said that the information exchanges helped them establish key contacts in their fields in the other country, who they then could contact with questions or issues that arose outside of the webinar series.
4. **Exposure to international experts**—In many webinars, the main participants from FHWA and NTC brought in external experts to discuss various topics. Participants from both sides remarked that the information exchange webinar series had exposed them to international experts in various fields.
5. **Proof of policy success**—In some cases, the information exchange series allowed the participants to expose others in their country to policy successes in the other country, which could change people's minds. One Australian information exchange participant said that by bringing in a certain reluctant stakeholder group on a particular project to a FHWA information exchange webinar helped them persuade the stakeholder group of the value of a certain policy. "Three sentences from Federal Highways experts was as good as three months of persuasion."
6. **Critique by foreign experts**—On some webinars, the open exchange of ideas that occurred after the presentation allowed one country to get feedback from a foreign expert, who could sometimes review a given situation more objectively than a domestic expert could—in other words, the foreign experts weren't so close to the problem. For example, NTC invited a port expert from Long Beach who participated in a webinar on multimodal issues to Australia to share the insight directly; and U.S. road pricing experts provided frank and independent advice to NTC, which resulted in a more robust road pricing review. The independent nature of the U.S. experts' input helped to counteract some local criticism of the NTC's review.

4.2 Challenges of the Information Exchange

One challenge to the success of the webinars was that the differences between the two countries made some policy issues more difficult to understand. One of the main areas of difference between Australia and the U.S. for transportation purposes is the differences of the two countries' geographies: Australia primarily comprises a number of dense cities and a great deal of sparsely populated countryside, with a fair amount of freight activity in remote mining and agricultural areas. In the U.S., by contrast, there are more medium density areas, more suburbs, and more small cities and towns. A second main area of difference was governance. In general, Australian states are more politically powerful than American states, especially regarding transportation. While the Australian federal government distributes a substantial amount of funding from the federal fuel excise tax to the states, aside from funding, there are very few policy levers available to the Australian federal government to coordinate state transportation activity. In the U.S., by contrast, the Highway Trust Fund and the various impacts of the constitution's Interstate Commerce Clause provide FHWA a stronger coordinating role among states. A third area of difference was in the area of non-governmental organizations. In the U.S., a majority of interstate trucking interests are represented by the American Trucking Associations, allowing outreach to and information gathering from long-haul truckers through one body. In Australia, there are several peak bodies that represent the heavy vehicle industry: for example, the Australian Trucking Association (and their member organizations including state-based transport/trucking associations); the Australian Logistics Council; and the Truck Industry Council. Given these geographic, governmental, and stakeholder differences, some policy issues required a fair amount of explanation for the members from the other country to fully appreciate them.

A second, closely related challenge was, given the differences between the two countries, how could lessons from one country be applied to the other country? For example, it is difficult for NTC to coordinate state activities in a way that the FHWA does, because it lacks similar policy levers. Depending on the policy issue, it can be challenging for one side to understand how to achieve the same policy as the other country.

A third challenge was how to articulate the benefits of a given webinar in advance. Both organizations desired to understand how they would benefit from each of the webinars before those webinars were held, both to justify holding the webinars and to attract more participants from within their own organization, but doing so was sometimes challenging. To articulate the benefits of each webinar in advance, before and after a given webinar topic was chosen, both teams can try to find similar, relevant cases or situations in their own country. Using similar cases or situations, each team can try to list the potential benefits of the upcoming webinar. However, as webinar participants learned unknown unknowns—things that they did not know they did not know—they found it is not possible to articulate all potential benefits of a given webinar in advance.

A final challenge was webinar logistics. Due to the time zone differences, webinars tended to be held in the evening, U.S. time, corresponding to the morning of the following day in Australia. Holding webinars after the normal workday was not ideal for U.S. participants, but there was no solution to this challenge. Also, there were sometimes challenges with the dial-in lines and other webinar tools. Telepresence technology is improving, which should mitigate this challenge.

4.3 Opportunity for the Information Exchange

The main opportunity mentioned for deepening the information exchange was to occasionally have in-person meetings, and also to potentially include personnel exchanges between the

organizations in addition to the information exchange. Having in-person contact allows for greater information exchange and greater trust among parties.

Personnel exchanges offer numerous benefits:

- Witnessing policymaking support in other countries allows participants to understand how things can be done differently in the home country.
- Participants gain deeper connections with key contacts at the other organization on a range of policy issues that they can leverage for years to come.
- Participants understand the lessons learned from the other country more deeply, having experienced them firsthand.

In an era of limited budgets, expanding the frequency of in-person meetings and introducing personnel exchanges will not be simple, but the benefits of such exchanges include reaping even greater benefits from the information exchange webinars.

5. Recommendations and Next Steps

This section presents recommendations and next steps in the FHWA-NTC information exchange program based on the information gathered from discussions held with information exchange webinar participants. First and foremost, everyone reached for discussions about this program said that the program should be maintained. There was a range of suggestions on possible future topics. Similarly, there was a range of suggestions on alternative approaches that could be taken in the program. Finally, personnel exchanges should be further explored to complement the information exchange webinar series.

5.1 Maintain the Program

All participants with whom discussions were held said that the program should be continued. They cited significant benefits, including all six benefits listed above in section 4.1, along with the minimal cost of the program, which typically amounted to a small number of person-hours of work in preparation for each webinar and the cost of the telepresence service.

While all participants supported keeping the program going, one participant said that it was important that, in the future, the potential benefits of each webinar be articulated in advance.

5.2 Future Webinar Topics

Everyone with whom discussions were held agreed that freight had been a great primary topic for the webinar series. Because of that, freight should be maintained as a topic in future webinars as well. However, there was a general opinion that the proportion of freight-focused webinars should be reduced in a future webinar series, to allow an exchange on more non-freight related topics. Freight topics proved very fruitful for both sides of the information exchange, and there is no indication that freight-related topics are becoming less productive. Three specific freight-related topics were mentioned as possible future topics by both U.S. and Australian information exchange participants:

1. **Truck Parking**, including software applications to reserve parking spaces and show space availability.
2. **Truck Platooning**, semi-autonomous truck operations in which one or more trucks autonomously follow a leader truck.
3. **Electronic Logging Devices** (electronic logbooks or electronic work diaries), tools that maintain electronic records of hours and locations of service and other values.

For topics other than freight, there were two areas that were mentioned most frequently:

1. **Infrastructure for Connected and Autonomous Vehicles**. Many of the webinar participants felt the vast, emerging areas of connected and autonomous vehicles present many opportunities for discussing technology and policy issues common to both countries. Both connected and autonomous technologies are already entering the vehicle markets in both countries, and greater understanding of technology and policy challenges will improve the approaches both countries take.
2. **Revenue Generation and Alternative Finance**. Both countries are facing severe revenue shortfalls due to declining revenues from fuel taxes, which is in turn due to increased fuel efficiency and electrification of the vehicle fleet. To make up for this, various states in both countries are exploring alternatives, such as distance-based charges for light and/or heavy vehicles, and public-private partnerships to fund specific

strategically important pieces of infrastructure. An exchange of ideas on these topics will benefit both countries as they both face similar funding challenges.

5.3 Future Webinar Approach

First, the webinar selection process should be formalized, and should begin with a specific webinar planning period. The approach should be given a specific structure and be written down. Doing so will ensure that input from all possible sources is included in the webinar selection process, ensure that potential benefits from each webinar are used to select the (a priori) most beneficial webinar topics, and ensure that the greatest number of beneficiary groups are included as participants in the webinars. The webinar planning period should be defined, and should occur at the same time annually. For the NTC an appropriate time may be June/July following the approval of its upcoming work program. For FHWA, a different time may be appropriate, so a compromise time period may need to be reached. At the commencement of the webinar planning period, NTC and FHWA should hold a planning webinar or teleconference to outline possible topic of information exchange. Holding such a live planning webinar will overcome the pitfalls of planning via email, namely, incorrect assumptions and misunderstandings of the core roles as of the two agencies). After the initial planning webinar, follow-up planning may occur via email.

Second, the future webinar series should be planned with benefits to each country in mind. This should take place during the webinar planning period described above. Potential benefits to both countries can be explicitly articulated, along with each potential webinar topic, and be used to help select topics. Both countries should list their perceived benefits independently of one another. Then, these benefits should be reviewed and kept in mind during the preparation for each webinar to ensure that the benefits are realized.

Finally, if topics are selected for inclusion in the webinar series that may be of interest beyond FHWA and NTC, additional audiences should be invited to the webinars beyond the FHWA and NTC in mind. During the webinar series, several webinars were held that included additional agencies, both as presenters and participants; for example, the FMCSA, and a group that included a Metropolitan Planning Organization (MPO) and representatives of certain ports. These webinars were successful, and the potential for hosting similar multi-group webinars in the future should be explored.

5.4 Explore In-Person Meetings and Personnel Exchanges

Several information exchange participants commented that having occasional (annual or every other year) in-person meetings, and exploring personnel exchanges would increase the benefits of the information exchange.

Holding an information exchange session in which several of the primary information exchange participants are present in person could facilitate greater exchange of information, and greater trust and understanding among the parties. In order to reduce costs for all parties, such an in-person meeting could be held immediately before or after a major international transportation conference which some of the participants might already be attending, such as an ITS World Congress. If no such conference can be found, it can be agreed that the location of the conference can alternate between the two countries. Participants unable to travel may still be able to participate by teleconference.

Even brief personnel exchanges (for example, two weeks), in which a representative from one country travels to the other country and takes on duties from an employee of the other organization, could still be very beneficial to both participants. To justify the funding such

endeavors, the potential benefits of exchanges should be articulated. Then, to the extent possible, such benefits should be measured following the exchange.

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