Recommendations and Strategies for IRP Truck Licensing Impacts for Ohio Counties

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February 2017

Prepared For:

Ohio's Research Initiative for Locals
Ohio Department of Transportation,
Office of Statewide Planning and Research

State Job Number 135261

Prepared in cooperation with the Ohio's Research Initiative for Locals, the Ohio Department of Transportation and the U.S. Department of Transportation, Federal Highway Administration.

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1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
FHWA/OH-2017-5		

4. Title and Subtitle	5. Report Date (Month and Year)
Recommendations and Strategies for IRP Truck Licensing Impacts for Ohio Counties	**February 2017**
	6. Performing Organization Code

7. Author(s)	8. Performing Organization Report No.
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9. Performing Organization Name and Address	10. Work Unit No. (TRAIS)
Kentucky Transportation Center **College of Engineering** **University of Kentucky** **Lexington, Kentucky 40506-0281**	11. Contract or Grant No. **SJN 135261**

12. Sponsoring Agency Name and Address	13. Type of Report and Period Covered
Ohio Department of Transportation **Research Section** **1980 West Broad St., MS 3280** **Columbus, OH 43223**	**Final Report** 14. Sponsoring Agency Code

15. Supplementary Notes

16. Abstract

Ohio local officials are concerned about IRP revenue shortfalls. County governments and taxing districts do not receive enough IRP revenue to fix pavement damage caused by commercial vehicles on local roads. Researchers determined this situation stems from a combination of Ohio's IRP distribution process and the growing phenomenon of jurisdiction shopping, which occurs when companies register trucks in an IRP jurisdiction that is not the vehicle's primary domicile location. In Phase II of this research, the research team evaluated six strategies to mitigate the impacts of jurisdiction shopping: (1) voluntary registration repatriation, (2) a domiciled vehicle voucher system, (3) redistribution of the IRP annual excess, (4) increased motor vehicle permissive tax, (5) increase IRP registration fees, and (6) a dedicated revenue stream. The implementation plan developed by the research team shows that the dedicated revenue stream has the fewest challenges and the most upside. Marketing and web design strategies should complement the state's efforts to reform the IRP distribution process, as these can enhance Ohio's IRP registration process.

17. Key Words	18. Distribution Statement
IRP revenue, commercial trucks, tax distribution, counties, jurisdiction, truck licensing	**No restrictions. This document is available to the public through the National Technical Information Service, Springfield, Virginia 22161**

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
Unclassified	**Unclassified**	**66**	

Form DOT F 1700.7 (8-72) **Reproduction of completed pages authorized**

Acknowledgements

The research team at the Kentucky Transportation Center would like to thank all members of the Technical Advisory Committee for their assistance with this project. In particular, thanks to Ohio County Engineer representatives Randy Partika (Mahoning County) and Jeff Linkous (Clinton County) for giving the research a general direction and identifying the conceptual problems addressed by the research project. Special thanks to Leora Knight, Stephanie Cook, and the rest of the Tax Distribution Section of the Ohio Department of Public Safety for assisting with the research and providing oversight of the tax calculations put together by the research team. Also, thanks to Tom Stiver of Xerox and Quan Boyd of the Bureau of Motor Vehicles for assisting with data collection efforts.

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Project Background

This research expands on a previous study (SJN: 134988) that assessed how IRP revenue distribution is impacted by non-Ohio registered commercial vehicle fleets based in Ohio jurisdictions. The objective of this project is to 1) provide recommendations for short-, medium- and long-term solutions to address the registering and/or fee allocation process for IRP registration within Ohio, 2) create an implementation plan that prioritizes the proposed solutions and 3) devise marketing strategies that can be used by local agencies to encourage trucking companies based in Ohio to repatriate any out-of-state IRP registrations. The research will strengthen the state's ability to ensure the appropriate retrieval and allocation of IRP registration revenue for maintaining Ohio's local roadways. It will also provide local officials with the tools and knowledge to conduct their own investigations as the economic and business circumstances in their localities change over time.

In the first phase of this study, researchers gathered data about IRP truck registrations, distributable IRP revenue, and tax distribution mechanisms. Revenue was tabulated for each Ohio county and their constituent taxing districts from 2009 to 2013 (or in some cases, 2014). The researchers calculated the county-level retention of direct IRP registrations, IRP loss compensation, and the annual excess compensation fund. Based on revenue trends, we forecasted the IRP impact from 2015 to 2019. Using national IRP fleet data, we determined the number of vehicles that belong to Ohio-based carriers and registered in another IRP jurisdiction. Using an estimated distribution of gross vehicle weight (as specific vehicle weights were not available for these trucks), the FY 2015 impacts were calculated based on the county location of each carrier. Additional information was gathered via surveys of county engineers and county-specific investigations. This information was used, along with the forecasts and 2015 IRP revenue impacts, to develop a five-year impact assessment for Clinton, Mahoning, Butler, and Franklin Counties. The five-year impact assessment, which included a projection based on past sales and a projection of potential revenue gain, calculated the potential gain based on what would happen if the approximately 20,000 vehicles currently registered out-of-state (but belonging to Ohio-based companies) were to register in Ohio. While some counties were projected to experience an

increase in revenues, others were expected to face declining revenues because adjustments in registrations may cause revenue distribution to fluctuate.

As a result of this work, an IRP licensing impact study was created and written to explain the project background, Ohio's tax distribution policy, registration trends, revenue trends, impacts, and county-level case studies. For the IRP licensing methodology, the research team created an IRP calculator for county engineers that allows them to enter fleet information and estimate the revenue impacts to their own county if a large firm should decide to engage in jurisdiction shopping in the future.

The study's impact estimates were calculated by using the number of out-of-state registrations belonging to companies with mailing addresses in each Ohio county. However, initial impact estimates included Alaska registrations which, despite being a member of the International Fuel Tax Association, is not an IRP member. Therefore, the original estimates, which included 811 Alaska trucks, were slightly high. Prior to beginning Phase II of the study, we removed the Alaska trucks, which dropped the number of out-of-state IRP registrations from 20,601 to 19,790. Table 1 (Chapter 1) shows the adjustments to statewide impacts based on the impact methodology used in Phase I. Initially, our estimate of the total impacts was just under $13.7 million, with $10.13 million to the counties, $2.89 million to municipalities, and $684,997 to townships. With the Alaska registrations removed, those estimates declined to $9.8 million for the counties, $2.7 million for municipalities, and $658,031 for townships – a total impact of $13.16 million.

Study Objectives

The goal of the study was to explore short-, medium-, and long-term policy solutions to the taxing district impacts caused by jurisdiction shopping for IRP registrations as well as marketing strategies and services offered to IRP customers in other states. The objective of the policy evaluations was to evaluate the impact on county registration revenues and the challenges and advantages to each particular policy. Another primary objective was to identify marketing strategies that Ohio officials could use to explain the importance of registering in a state where their vehicles actually operate to handle maintenance costs and meet infrastructure needs for industry. Last, the team developed implementation plans based on the information gathered about each strategy.

Description of Work

We used data and findings from Phase I as a basis for investigating six policy solutions. The group analyzed distribution numbers for the IRP annual excess, impacts for each county, County Business Pattern data from the U.S. Census Bureau, IRP fees in Ohio and surrounding states, and state transportation revenues. From these data, the research team identified six distinct approaches and calculated the net impact each would have on county IRP revenue stream where applicable, and identified institutional, legal, political and economic factors that could influence the chances of each solution's success. The research team also gathered information on IRP registration services offered in other states and analyzed Indiana's IRP website – Indiana has the largest share of out-of-state registrations for Ohio-based companies. Based on this information, we assembled an implementation plan that details the challenges and advantages of each policy solution.

Research Findings & Conclusions

The research findings show that each policy strategy designed to address IRP distribution impacts has strengths and weaknesses. The voluntary repatriation strategy requires no legal changes or dedicated revenue, but it lacks the force of law and will only be as effective as the county engineers who explain the problems to industry, and potentially the degree to which grants, loans and tax incentives can be leveraged for companies willing to bring registrations back to Ohio. A voucher system whereby county engineers identify domiciled vehicles could be developed and implemented. However, forecasting the impacts of this system is challenging because it is unclear how many county engineers would pursue it, how receptive trucking companies would be to verifying information, how the state would legally define a "domiciled truck," and how many such vehicles exist given that registrations are counted differently than in the other strategies. The redistribution strategies utilize the IRP annual excess to ameliorate the out-of-state registration impacts to counties, but in each case, the majority of counties have net losses because the registration impacts are concentrated in a small number of counties. The motor vehicle permissive tax strategy can only be undertaken at the local level. It will require the adoption by county commissioners and (most likely) local residents. IRP fee increases are another potential avenue, but the trucking industry will oppose them, shift the tax burden from jurisdiction shoppers to others, and potentially make Ohio less competitive for trucking industry business than surrounding

states. The dedicated revenue stream would avoid most of the previously mentioned complications but may come at the cost of certain state programs/initiatives that would otherwise be funded by state funds.

We also note that Ohio local officials wants to augment current marketing efforts to reach more carriers and raise awareness about the potential issues caused by jurisdiction shopping. Analysis of other states, along with Indiana's website, shows there are several options that can be considered in terms of improving online presence and enhancing website functionality. Web design, online videos, online services, online assistance, accessibility, maintenance, and adherence to World Wide Web Consortium standards are essential for online vehicle regulation websites.

Recommendations for Implementation of Research Findings

We recommend that Ohio local officials review the implementation plan in Chapter 5. The implementation plan specifies 13 challenges and 6 advantages for each IRP distribution impact strategy. Each strategy has strengths and weaknesses. Three approaches – voluntary repatriation, IRP fee increases, and direct appropriation have the most advantages (3) and fewest challenges (4). In particular, the increase of IRP fees and direct appropriation are very strong candidates because they fully address the financial impact of jurisdiction shopping. However, there are two caveats worth mentioning. First, there may be other factors not identified here that local officials will want to consider. Second, the analysis gives each challenge and advantage equal weight, which is not necessarily how Ohio local officials might weight each challenge and advantage. Additionally, consideration should be given to better market the IRP features Ohio offers and how the state can improve its website to become more competitive with other states.

Chapter 1: Introduction

The purpose of this research is to expand upon a previously conducted study (SJN: 134988) that assessed the impact of non-Ohio registered commercial vehicle fleets based within Ohio jurisdictions on IRP revenue distribution. The objective of this project is to 1) provide recommendations for short-, medium- and long-term solutions to address the registering and/or fee allocation process for IRP registration within Ohio, 2) create an implementation plan that prioritizes the developed solutions and 3) devise marketing strategies that can be used by local agencies to encourage trucking companies based in Ohio to repatriate any out-of-state IRP registrations. The research will strengthen the state's ability to ensure the appropriate retrieval and allocation of IRP registration revenue for maintaining Ohio's local roadways. It will also provide local officials with the tools and knowledge needed to conduct their own investigations as the economic and business circumstances in their localities change over time.

Research Context

In the first phase of this study, researchers gathered data about IRP truck registrations, distributable IRP revenue, and tax distribution mechanisms. Revenue was tabulated for each Ohio county and their constituent taxing districts from 2009 to 2013 (or in some cases, 2014). The researchers calculated the county-level retention of direct IRP registrations, IRP loss compensation, and the annual excess compensation fund. By using revenue trends, IRP impact was forecasted from 2015 to 2019. Using national IRP fleet data, the research team determined the number of vehicles belonging to Ohio-based carriers and registered in another IRP jurisdiction. Using an estimated distribution of gross vehicle weight (as specific vehicle weights were not available for these trucks), the FY 2015 impacts were calculated based on corresponding taxing district where each carrier is located. Additional information was gathered via surveys of County Engineers and county-specific investigation. This information was used, along with the forecasts and 2015 IRP revenue impacts, to create an extrapolated five-year impact assessment for Clinton, Mahoning, Butler, and Franklin Counties. The five-year impact assessment for the counties, which included a projection based on past sales and a projection of potential revenue gains, forecasted the potential gains that would be realized if the 20,000 vehicles registered out-of-state were to register in Ohio. While some counties are projected to experience an increase in revenues, others may see a decline as adjustments in registration may cause fluctuations in revenue distribution.

As a result of this work, an IRP licensing impact study was created and written to explain the project background, Ohio's tax distribution policy, registration trends, revenue trends, impacts, and county-specific case studies. For the IRP licensing methodology, the research team created an IRP calculator for county engineers that allows them to enter fleet information and estimate the revenue impacts to their own county if a trucking firm decides to engage in jurisdiction shopping in the future.

In 2015, the study projected that the individual revenue gain for some of Ohio's counties and taxing districts would total just under $13.7 million. The jurisdiction-shopping impact for Ohio's 88 counties was $10.13 million, with $8.23 million in direct effects and $1.9 million in indirect effects. Municipalities suffered negative impacts of $2.89 million, all in direct effects. Total township impacts were $684,997, with $6,633 in direct impacts and $678,364 in indirect impacts. These estimates assumed the repatriation of every potential out-of-state truck to every county. The direct, county-specific impacts (excluding townships, municipalities or indirect county impacts) varied greatly from county to county. In 14 counties, there was no impact; another 38 counties saw an impact of less than $10,000. Seventeen counties had revenue displacement between $10,000 and $49,999. The next nine counties faced more substantial losses: between $50,000 and $99,999. We estimated that four counties would lose between $100,000 and $199,999 in registration fees. Three other counties lost between $200,000 and $600,000. The three most-impacted counties were Clinton County ($3.13 million), Franklin County ($1.45 million), and Hamilton County ($822,916). Thus, the most significant impacts were concentrated in 19 Ohio counties. The study did not produce estimates for each township and municipality.

Adjustments to Phase I Impact Estimates

The study's impact estimates were calculated using the number of out-of-state registrations belonging to companies with mailing addresses in each Ohio County. However, the initial impact estimates included Alaska registrations, which despite being a member of the International Fuel Tax Association, is not an IRP member. Therefore, the original estimates, which included 811 Alaska trucks, were slightly high. Before beginning Phase II of the study, we removed the Alaska trucks, so the total out-of-state IRP registrations dropped from 20,601 to 19,790. Table 1 shows the adjustments to statewide impacts based on the impact methodology utilized in Phase I of the study. Initially, we estimated the total impacts of just under $13.7 million, with $10.13 million to

the counties, $2.89 million to the municipalities, and $684,997 to the townships. With the Alaska registrations removed, those estimates fall to $9.8 million for the counties, $2.7 million for the municipalities, and $658,031 for the townships, for a total impact of $13.16 million.

Table 1. Adjusted IRP Out-of-State Impact Estimates

Impact (Direct & Indirect)	IRP Jurisdictions + AK	IRP Only
County Total	$10,128,499	$9,799,058
Municipal Total	$2,886,452	$2,703,534
Township Total	$684,997	$658,031
Grand Total	$13,699,949	$13,160,623
Vehicles	**IRP Jurisdictions + AK**	**IRP Only**
OOS Municipal Vehicles	12,766	11,957
OOS Township Vehicles	7,835	7,833
All OOS Vehicles	20,601	19,790

In terms of vehicles, all but two of the impacted registrations were in municipalities, not townships. This distinction matters because the distribution of impacts on counties are larger for vehicles registered in townships than vehicles registered in municipalities. The direct county impacts (discounting Alaska) were $7.98 million. These impacts – which do not include indirect effects – did not move any county to a different impact category, except for Hamilton County, which moved from the $600,000+ category to the $200,000 to $599,999 category. Indirect effects included the 9 percent distribution based on county road miles and the 5 percent distribution. The county-level impacts specified in Phase I of the study did not include these indirect impacts, but they are included in Phase II, along with municipality impacts, and direct and indirect township impacts. For county-by-county impacts for each category, see the supplementary Excel data file.

Chapter 2: IRP Truck Licensing Strategies

The following analysis attempts to address IRP jurisdiction shopping impacts by utilizing a variety of short-, medium-, and long-term strategies designed to ameliorate the problems detailed in Phase I, and in the previous sections of this report. Several strategies are explored here. The short-term strategies include convincing carriers with out-of-state registrations to repatriate registrations (Strategy 1) to Ohio, and possibly explore raising local permissive taxes (Strategy 4). Medium-term strategies all relate to changes in the way IRP excess funds are distributed by the Tax Distribution Section of the Ohio Department for Public Safety (ODPS) (Strategy 3). The research team explored various distribution mechanisms, based on both the distribution of out-of-state plate registrations and the County Business Patterns (CBP) data the U.S. Census Bureau maintains. Another medium-term strategy is implementing a voucher system for county engineers to verify out-of-state registrations belonging to trucks domiciled in Ohio (Strategy 2). Two long-term strategies are investigated. The first is a dedicated revenue stream to address IRP out-of-state registration impacts by increasing IRP registration fees (Strategy 5). The second is using available funds from non-IRP sources (Strategy 6); additional research is needed to identify a particular funding source. The research team documented impacts for each county, and evaluated the pros and cons of each strategy so that Ohio local officials can decide how to proceed based on the results of the study.

Strategy 1: Convince Motor Carriers to Repatriate Registrations

The most straightforward and simple way to address IRP distribution impacts is to encourage that companies voluntarily repatriate out-of-state registrations to Ohio. Whenever IRP registrations come up for renewal, companies based in Ohio but registering vehicles in other states for tax (or fee) advantages would change the base jurisdiction of all relevant trucks (or power units) to Ohio. Doing so should not alter the registration fees paid to Ohio or other participating jurisdictions unless the distribution of miles logged in each jurisdiction changes. What does change is the way ODPS distributes those funds in accordance with ORC 4501.044. Rather than go to the loss compensation fund, and supplementing the Ohio portion of remaining in-state registrations, these registration fees would go to the in-state registration pool, thereby anchoring a much larger percentage to the local taxing districts (i.e. the relevant county, township, and/or municipality). Put another way, rather than revenue from such vehicles being used to make up for losses due to apportionment of IRP

registration fees for other registrations, the majority of that revenue would stay with the taxing district of operation.

There are several components to consider if pursuing such a strategy. First, most members of the Ohio's trucking community are probably unaware how IRP registration fees are distributed. Given the complexity of the state's distribution, this is difficult even for interested parties to follow. As a result, state and local officials would have to design and execute a marketing and education campaign to raise awareness within the trucking industry about the impact of IRP jurisdiction shopping on the availability of revenue, and by extension the quality of infrastructure in their communities. Second, Ohio may have some success in creating economic incentives for motor carriers through economic development programs administered by the Ohio Development Services Agency (ODSA). This could be done by simplifying the registration process, offering other electronic services that save motor carriers time or money, or altering the highway safety fee portion of Ohio IRP vehicle registration fees to eliminate the difference between in-state and out-of-state registration fees. The Highway Safety Fee of $30 is not apportioned for in-state IRP registrations but is apportioned for out-of-state registrations, which may be another factor prompting carriers to shop in other jurisdictions. Third, county engineers and other local officials interested in repatriating registrations must be aware of the issue and be willing to make what is often a sustained, protracted effort to convince companies why it is imperative to register their vehicles in the county in which primary truck operations occur and vehicles are domiciled.

Motor carriers are naturally interested in pursuing their economic self-interest. Recognizing the potential economic benefits that accompany the investments of trucking companies, states like Indiana and Oklahoma have aggressively recruited trucking companies by offering advantageous registration fees, more efficient electronic registration processes, property tax breaks, tax exemptions for new vehicle purchases, and the ability for the company to issue their own license plates without going to the state or local vehicle licensing agency (Casavant and Jessup, 2004). In response, Ohio has implemented some, but not all of these policies (more about this in Chapter 4). Such incentives confer substantial economic and financial benefits through lower taxes (or fees) and compliance costs. However, the development and maintenance of highway infrastructure in the communities where these companies have terminals is also of utmost importance.

Local engineers have several opportunities to make their case to the trucking community. First would be a marketing campaign directed at individuals who register new vehicles, apply for CDLs, or file quarterly IFTA tax returns. Information cards and mailers could be designed and printed or e-mailed to members of the trucking community in Ohio along with registration reminders, tax filing reminders, or any other correspondence between ODOT and ODPS and motor carriers. Second, county engineers and members from ODPS could request an invitation to the annual conference or trade show hosted by the Ohio Trucking Association, or other high-profile gatherings of trucking industry members from around the state. Last, Ohio should consider designing and executing a social media campaign on various platforms, such as Facebook, Twitter, and Google+. A combined approach which blends all of these approaches to educating the trucking community about the impacts of registration decisions, and how the industry can help address these problems by repatriating out-of-state truck registrations for trucks operating in the state.

Another approach to incentivizing companies to switch registrations from another jurisdiction to Ohio is adapting economic development programs to assist Ohio trucking businesses. The ODSA has several programs that subsidize or incentivize private sector investment. Table 2 shows a list of programs that have been utilized for trucking companies or multimodal transportation entities for grants or loans. The list may not be comprehensive, but we attempted to identify as many companies as possible by examining ODSA reporting records using a limited list of keywords common to these company names.[1]

Between August 1, 2010 and August 1, 2016, the ODSA provided at least 92 grants totaling $15.7 million to transportation-related enterprises (i.e., trucking companies, railroads, airports, and port authorities) and 23 loans totaling $74.8 million. There were several funding sources or programs where these grants were distributed, including economic development support, facilities establishment, federal stimulus funds, special federal revenue, general state revenue, job development initiatives, local government innovation, logistics and distribution infrastructure, minority business enterprise, workforce or job training programs, roadwork development, and workforce development initiatives. Additionally, the ODSA offered more than $783 million in tax incentives to companies between 2009 and 2016 for its Job Creation Tax Credit and Job Retention Tax Credit, some to transportation

[1] These companies were identified by matching any recipients with the words “trucking,” “logistics,” “transport,” “rail,” and “port authority” in the title.

companies.[2] None of these programs, or the tax incentive programs ODSA administers, are managed based on IRP registration impacts, but Ohio officials could design and execute programs to address jurisdiction shopping and out-of-state IRP registration issues, either through grants for companies that repatriate registrations or tax credits that allow trucking businesses to offset the increased cost of registering in Ohio relative to other jurisdictions. County engineers could also explore program requirements or submit modification requests to ODSA to help companies obtain grants, loans or tax credits exchange.

Table 2. ODSA Grants and Loans to Transportation Companies and Port Authorities

Funding Source	Amount	Grant	Amount	Loan
Economic Development Support	$55,000	3		
Facilities Establishment			$24,500,000	6
Fed Stimulus (Energy Efficiency and Conservation)			$1,632,500	1
Federal Special Revenue	$1,751,295	26	$21,150,965	2
General Revenue	$4,450,749	21		
Job Development Initiatives	$850,000	3		
Local Government Innovation	$380,800	5	$500,000	1
Logistics & Distribution Infrastructure			$17,252,361	6
Minority Business Enterprise			$187,500	1
Ohio Workforce Job Training	$827,152	15		
Roadwork Development	$7,179,518	18	$9,573,480	6
Workforce Development Initiatives	$200,000	1		
Total	$15,694,514	92	$74,796,806	23

Calculating the financial impact of repatriating out-of-state IRP registrations would have on counties depends on several factors. First, there are both direct and indirect impacts, and those can differ among counties. Direct impacts would be influenced by the registered truck weight, proportion of municipal vehicle registrations, and percentage of total county road miles maintained by a particular county. Because a county gets to keep less of the registration when the vehicle is registered in a municipality, the impact varies by county. Small fractions of each registration go to each county based on county miles or the even share all counties get. There are also direct and indirect impacts on the municipalities and townships. Second, the number of vehicles a particular company has to re-register will also vary depending on the company. Another potential impact will occur later during the IRP Annual Excess redistribution, but this impact is generally small, because calculations take into account

[2] The estimate is based on a report available for download from the Ohio Development Services Agency at: http://development.ohio.gov/reports/default.htm

the total number of vehicles registered in a particular taxing district. Third, because the distribution of fees to the district of registration comes from IRP revenues that previously went to other counties downstream in the distribution process, an indirect impact redounds to all other taxing districts when the Annual IRP Excess is distributed.

Clinton County provides a large-scale example of how returning registrations from other jurisdictions to Ohio-based terminals or headquarters would look. Table 3 shows five potential scenarios if a large trucking company based in the county returned some or all of its power unit registrations. The scenarios effectively cover a return of all registrations, or a partial return of 5,000, 4,000, 3,000, or 2,000 registrations of its overall fleet of 5,810.[3] Every scenario consists entirely of township vehicles except for Scenario 1, which includes two municipal vehicles not registered to the larger company. Scenario 1 encompasses all vehicles in the county, whereas Scenarios 2-5 represent cutoffs corresponding to various levels of effectiveness. There are certain realities, such as the refusal

Table 3. IRP Registration Repatriation Scenarios for Clinton County

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Repatriated Registrations	5,810	5,000	4,000	3,000	2,000
Repatriated Township Vehicles	5,808	5,000	4,000	3,000	2,000
Repatriated Muni Vehicles	2	0	0	0	0
Impacts to Clinton County Taxing Districts					
Clinton County Direct	$3,134,555	$2,697,941	$2,158,353	$1,618,764	$1,079,176
Clinton Co. Townships Direct	$1,396	$1,201	$961	$721	$481
Clinton Co. Municipal Direct	$452	$0	$0	$0	$0
All Clinton Taxing Districts	$3,136,403	$2,699,142	$2,159,314	$1,619,485	$1,079,657
Impacts to Other Counties and Taxing Districts					
Indirect Other Counties (Miles)	$344,545	$296,511	$237,208	$177,906	$118,604
Indirect Other Townships (Miles)	$191,791	$165,052	$132,042	$99,031	$66,021
Indirect Other Counties (Equal)	$190,991	$164,364	$131,491	$98,619	$65,746
Total Indirect Impact	$727,327	$625,927	$500,741	$375,556	$250,371
Impacts to All Counties, Taxing Districts					
Grand Total Reallocation	$3,863,730	$3,325,069	$2,660,055	$1,995,041	$1,330,028

[3] Fleet numbers are based on the counts used in Phase I of the study.

of all companies to participate, or the possibility they will only repatriate a portion of their IRP fleet. Large trucking companies with national operations typically plate vehicles in a single state, even though many of those vehicles may never actually travel in the base jurisdiction.

Impacts are summarized in three successive sub-tables. For Clinton County, the impacts would all be gains, because those registrations would come directly to local taxing districts through in-state registration allocation and from loss compensation from other out-of-state IRP registrations. Depending on the scenario, impacts range from $3.13 million to $1.08 million. There are also modest gains to Clinton County townships for all scenarios, as well as a small gain for municipalities in Scenario 1. Because counties also receive indirect funds from each in-state registration – albeit a small amount – we calculated the indirect impact to other counties and townships. In Scenario 1, these indirect impacts come to $727,327, and gradually decline to $250,371 in Scenario 5. If we combine the cumulative impacts of direct revenue allocation to Clinton County taxing districts and indirect revenue allocation to all counties and townships[4], the total impact comes to $3.86 million in Scenario 1, gradually declining to $1.33 million in Scenario 5.

Table 4 captures the magnitude of the downstream impact to the IRP annual excess fund, which ultimately hinges on there being leftover IRP compensation funds after all in-state registrations are "made whole" by supplementing the apportioned registration with out-of-state IRP fees.[5] Assuming a static environment where no other fundamentals change, the shifting of funds would ultimately leave fewer dollars for the ODPS Tax Distribution Section to distribute for the IRP Annual Excess. Once all loss compensation is taken into account, there will be fewer funds left for the annual IRP excess distribution than there were previously. The 2014 IRP Annual Excess was $8.66 million, which is static in each scenario, where we calculated an alternate IRP Excess by subtracting the reallocation amount from the actual IRP excess. Each of these scenarios reduces the Annual IRP Excess fund by as much as 44.6 percent or as little as 15.4 percent depending on the scenario. Consequently, all taxing districts will feel the effects if Clinton County registrations are repatriated.

[4] The indirect share includes indirect allocations to Clinton County and its townships.
[5] For more information about this process, see Phase I of the study.

Table 4. Downstream Impact of Redistribution on IRP Annual Excess

Scenario	Clinton County	Actual IRP Excess	Alternate IRP Excess	%Change
1	$3,863,730	$8,656,070	$4,792,340	-44.6
2	$3,325,069	$8,656,070	$5,331,001	-38.4
3	$2,660,055	$8,656,070	$5,996,015	-30.7
4	$1,995,041	$8,656,070	$6,661,029	-23
5	$1,330,028	$8,656,070	$7,326,042	-15.4

There will be some positive impacts during the in-state/loss compensation process, but there will also be losses during the IRP annual excess distribution. Clinton County will be affected by these small IRP annual excess losses, but would still experience a windfall compared to the status quo when the repatriated registrations are taken into account. The key takeaway is that whenever these registrations shift into and out of Ohio, irrespective of the reason, the impact affects counties, townships, and in some cases, municipalities, around the state. These types of revenue shifts currently take place all the time due to the complexity of IRP tax distribution, although rarely at this scale. And impacts to most counties are small, or at least not large enough to raise flags, because county engineers are accustomed to annual fluctuations in incoming vehicle licensing revenue.

1.1 Factors to Consider

Convincing trucking companies to repatriate IRP registration fees to Ohio will allow state and county officials to better appropriate fees in accordance with local road usage. Voluntary repatriation would require no legal remedies by local or state governments, and although there are potentially impacts on other counties, current law would not require the buy-in of other entities with possibly competing interests. The challenge is that this is a piecemeal solution rather than a comprehensive reform, and the most likely outcome is pockets of success and other instances where no agreement is reached. County engineers lack the authority to provide any leverage or bargaining chips to entice motor carriers to re-register in Ohio, so they would need to convince the ODSA to help them formulate a program that has state support in order to use loans, grants or tax credits as inducements. Last, there are insufficient funds in the IRP Excess fund to address systematic out-of-state IRP registration issues. Put differently, if every registration were repatriated, there would not be enough money to pay all of the counties their dues. This situation would require the ODPS Tax Distribution Section to make some adjustments, such that not every county would get revenue equal to the impact of IRP base jurisdiction shopping.

Strategy 2: Domiciled Vehicle Voucher System

The redistribution mechanisms detailed as part of Strategy 3 would reallocate the entire amount of the IRP annual excess distribution based on comprehensive data for each county. These data provide great insight to the dynamics of out-of-state registrations and economic activity related to commercial trucking in each county. However, there is one class of operations that it may miss entirely – companies with terminals and vehicles domiciled or operating in Ohio, but which are headquartered and have plates that are located/registered in another state or jurisdiction. This can include large trucking companies with complex distribution networks, parcel services such as UPS or FedEx, leasing companies, or other multistate companies that lack an extensive paper trail in Ohio. County engineers are often anecdotally aware these companies exist, but are not always sure whether they are paying adequate registration fees to the Ohio taxing district in which they reside or operate.

Instead of reallocating the entire IRP annual excess, this voucher system would allow county engineers to apply for disbursements from the IRP annual excess fund prior to its current distribution mechanism. County engineers would identify trucking companies with vehicles domiciled in the county, estimate or ask the company how many vehicles they domicile, and have them to sign a form confirming the existence of those vehicles. This form could be designed by ODPS in concert with county officials and industry members as appropriate. The process would be voluntary for the trucking companies. Given that it would not change the amount of registration fees owed, and would bring additional revenue to the company's local taxing district, companies should have sufficient incentive to participate in the voucher program. The engineer would file the forms with the ODPS Tax Distribution Section, which would allocate registration fees to county engineers as if those companies were registered in that county. This would mean that for each vehicle certified on the form, a county would receive what it would normally receive for its share of an in-state registration. Only vehicles not already registered in Ohio would be eligible for vouchers.

Figure 1 shows the impact of the voucher system for the average Ohio county. The dotted purple line shows the average IRP excess received by a county in 2014 ($98,364), and the blue dashes show the average impact that out-of-state IRP registrations have on the amount normally received by a county taxing district ($111,353). There are three lines based on the average amount

of revenue a county gets depending on whether a registration is located in a township or municipality. Counties get to keep the 34 percent share of the distributable amount of an IRP registration if it is in a township; they do not get to keep it if the vehicle is in a municipality. The yellow line represents the amount of revenue for purely township registrations; the red line represents the amount of revenue for purely municipal registrations. The green line is the weighted average based on the ratio of out-of-state, municipal-to-township IRP registrations (the data are 60.4 percent municipal, and 39.6 percent township). The table embedded within the figure denotes how many municipal, township or combination registrations it would take to meet current IRP annual excess revenue amounts for the average county, or address out-of-state revenue impacts for the average county. To recover the amount of IRP excess through a voucher system, the average Ohio county would need to locate 242 out-of-state vehicles domiciled in municipalities, 156 out-of-state vehicles domiciled in townships, or 199 eligible vehicles from both types of districts to receive as much IRP excess as they do under current state law. To recoup the average out-of-state impact, they would need to identify 274 municipal vehicles, 176 township vehicles, or 225 eligible vehicles from townships and municipalities.

Of course, looking at the average county elides the circumstances of individual counties. The average impact is different for each county because the number of out-of-state registrations belonging to trucks in each taxing district, as well as the ratio of municipal-to-township registrations, is different. We calculated the number of eligible registrations each county engineer would need to identify and verify to get approximately the same amount of IRP annual excess revenue as they do under the current system. The averages per registration is based on the distribution of municipal and township out-of-state IRP registrations. For example, Clinton County's out-of-state IRP registrations are almost entirely located in townships, so the average is $631.68. Toward the other end of the scale is Hamilton County, which averages $407.90 thanks to a large share of municipal registrations.

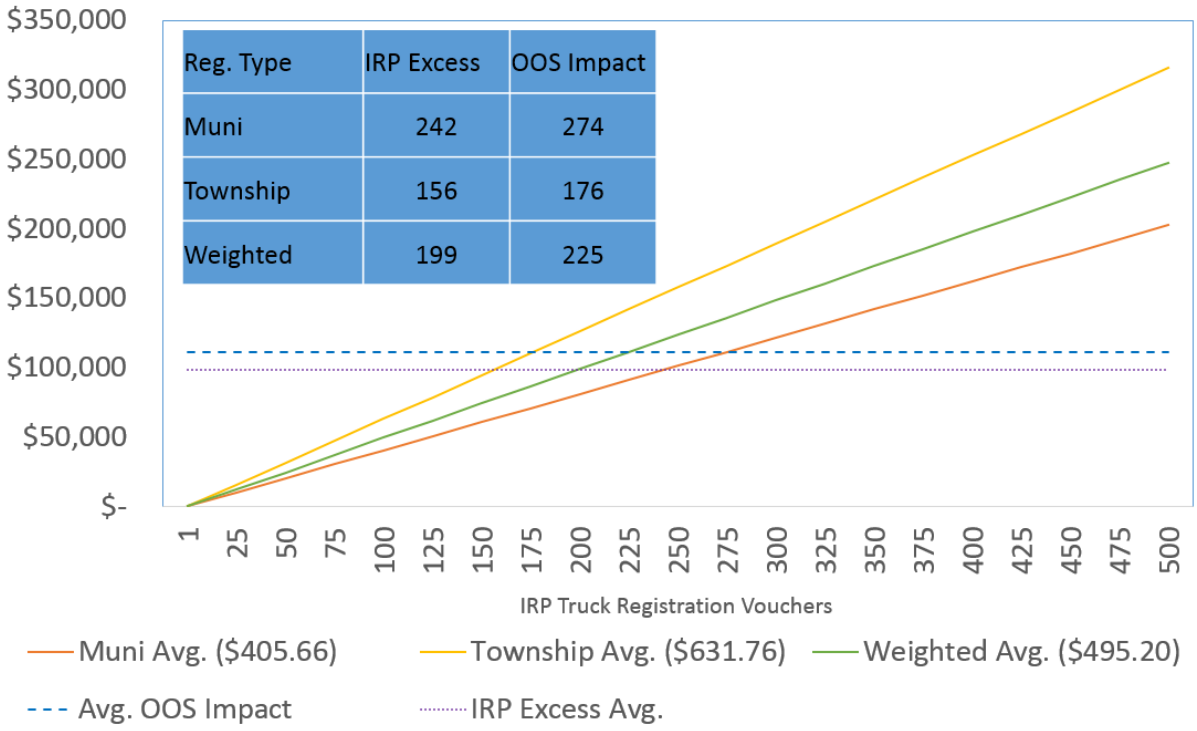


Figure 1. Impact of Voucher System for Average Ohio County, 2014

Figure 2 shows the number of registrations each county would require to equal the 2014 IRP annual excess distribution. The state map is color-coded to denote a greater or lesser number of registration vouchers necessary for a county to match its current level of IRP annual excess. There are four categories: 50 to 99, 100 to 199, 200 to 499, and 500 to 1399. The number of potential vouchers available to a county in many cases will not match this current distribution, since the distribution is dictated by state law. Currently, Franklin County would need the most vouchers, followed by Cuyahoga County. Vinton County would only need 53, as they have the smallest county share of the 88 Ohio counties. These numbers only indicate what counties would need to do in order to continue receiving the current excess amount. They do not include township or municipal allocations, which would demand separate consideration. If county engineers see a large out-of-state registration impact in their taxing district, they would need to identify and verify more vouchers than the number listed in Figure 2.

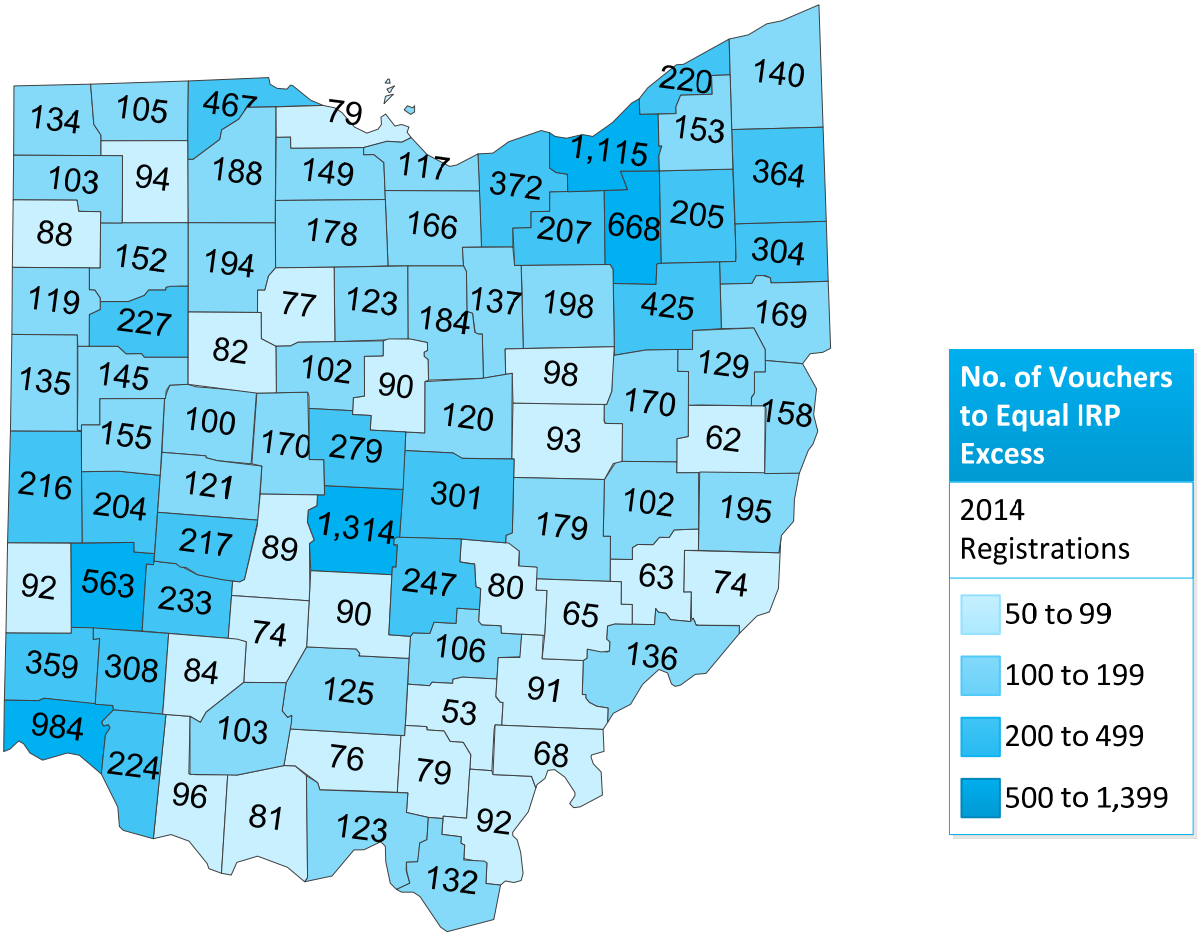


Figure 2. Number of Vouchers Needed to Sustain Current Revenues

To determine how many vouchers county engineers would need to adequately address all of the estimated out-of-state IRP registration impacts in their taxing district, we divided the estimated impact by the expected amount received per registration to determine the number of vouchers. This number would be higher in 11 counties, and lower for the rest. Figure 3 displays the number of vouchers needed to erase the impact of out-of-state registrations in each county. More than half of these vouchers (10,406) would need to be procured in Clinton and Franklin Counties. This map reveals the same clustering patterns that came up during the Strategy 3 section: many registrations in a small number of counties. Several counties have no domiciled commercial trucks with out-of-state registrations – at least none that can be documented using CVIEW data.

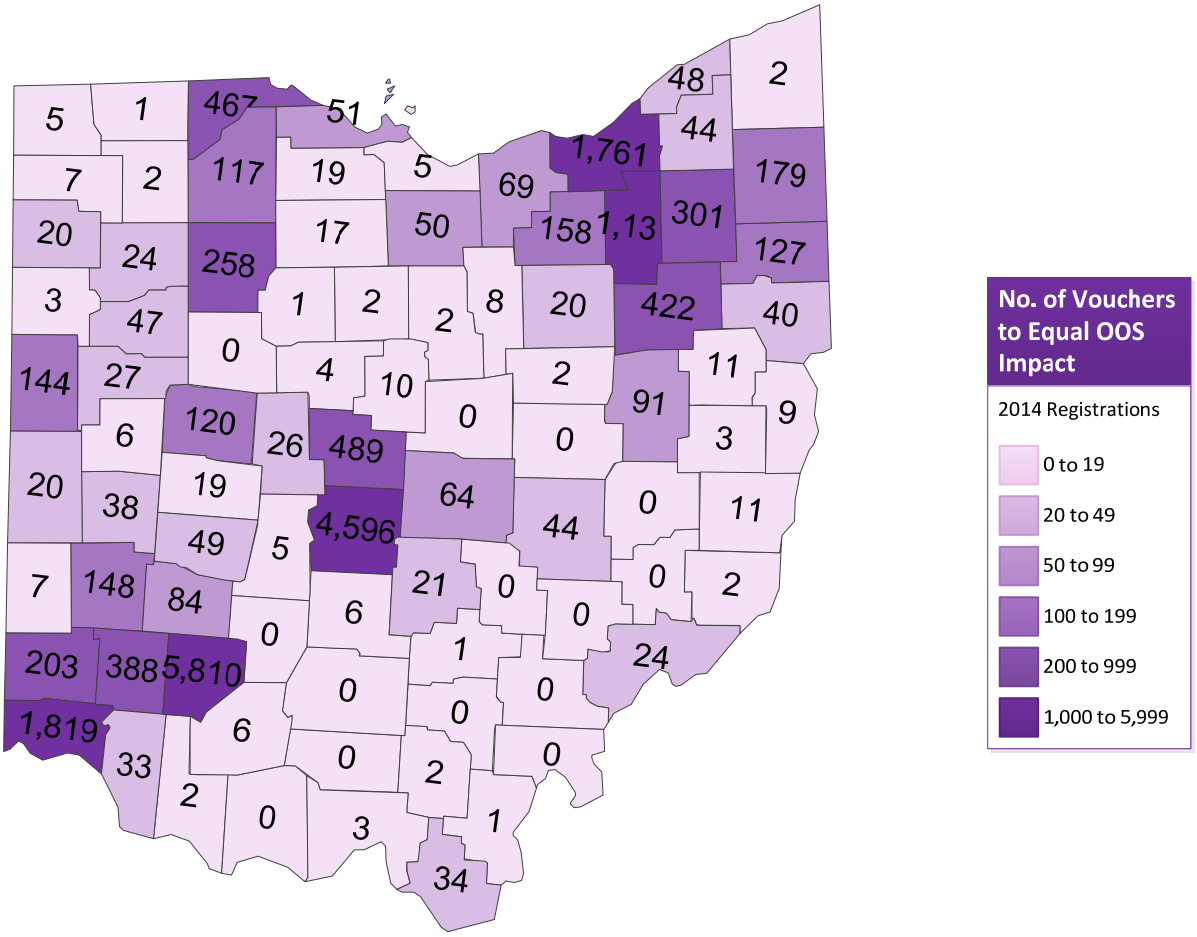


Figure 3. Number of Vouchers Needed to Address Out-of-State Registration Impacts

2.1 Factors to Consider

The voucher system may be a more attractive option to some county engineers because it gives them the option to address out-of-state IRP registration issues on a discretionary basis. Under this system, they will have the ability to identify domiciled vehicles in their counties but plated in other jurisdictions. They will have to convince trucking companies to confirm those vehicles, which could be a challenging process if companies are reluctant to authenticate private information about operations or do not wish to deal with what they perceive as onerous requirements. The program could be made especially flexible, and adjustable from year-to-year based on available revenue and the number of voucher requests. Unlike the CBP-based distribution strategies, this strategy will let the impacts be addressed based on the economic activity of the moment rather than relying on lagged data (by two years). Another prime feature of the voucher system is that it

would not necessarily lead to large net losses among a large number of counties. The impact would depend upon the adoption of the voucher approach by individual county engineers and the number of approved vouchers. These impacts are less likely to be as large as under a systematic change in the distribution process.

The voucher system also presents challenges. It is difficult to forecast financial impact rates because it is unclear how widely county engineers would embrace a voucher system, whether trucking companies would voluntarily participate, and given the lack of data, the number of voucher-eligible IRP trucks domiciled in the state. The very concept of vehicle domicile is another difficult question to address. What does it mean for a vehicle to be domiciled in a particular county? How should domiciled vehicles be measured? One could do a vehicle-specific assessment based on how often a vehicle was parked at a trucking company terminal, or simply average the number of vehicles parked at a terminal over a particular period of time. There would also be some difficulties administering the program. If there were a high adoption rate, and the amount of vouchers claimed exceeded the amount of IRP annual excess for the year, the ODPS Tax Distribution Section would have to devise a proportional payout based on the ratio of claims to available funds. Regardless, tax administrators would face an additional layer of complexity in what is already an intricate tax distribution system.

Strategy 3: Redistribution of IRP Annual Excess Fund

If county engineers decide that voluntary repatriation of IRP registration fees and/or increasing the motor vehicle permissive tax is an insufficient approach, another option is to restructure how the IRP Annual Excess Fund is distributed to the counties. It is possible to keep the current allocation mechanisms for townships and municipalities while altering the distribution mechanisms for the counties. Currently, the county share (for all taxing districts) of the IRP annual excess compensation is determined by dividing the total amount of excess compensation to be distributed by the amount of license tax distributed to all counties[6]. Here, we propose five alternative IRP excess distribution methods. The first method is based on each county's percentage of out-of-state IRP registrations by trucking companies based in Ohio. Three methods are based on each county's percentage of trucking industry employees, payrolls, and establishments. A fifth

[6] For more information on how the IRP annual excess compensation works, see Chapter 2 in the Phase I report for this study.

method is a hybrid distribution of both out-of-state registration and current IRP annual excess distribution to the counties.

3.1 IRP Annual Excess Redistribution Using Out-of-State IRP Registrations

This mechanism redistributes the county share of the IRP annual excess compensation fund. Table 5 shows the county potion of annual IRP Excess Compensation, the total amount of IRP Excess Compensation, and the total monthly license tax distribution.[7] The vast majority of the IRP excess compensation distribution goes to the county. The remainder goes to the municipalities

Table 5. Annual IRP Excess County Portion, Total, and License Tax Distribution

Annual IRP Excess Compensation Distribution				License Tax Distribution**
Year*	County Portion	Total	Municipal and Township	
2005	$9,090,041	$10,293,206	$1,203,165	$311,430,346
2006	$8,678,625	$9,829,219	$1,150,594	$314,567,688
2007	$9,535,430	$10,801,649	$1,266,219	$312,180,625
2008	$7,493,624	$8,481,750	$988,126	$304,740,325
2009	$8,779,863	$9,930,743	$1,150,880	$295,150,735
2010	$8,233,758	$9,310,357	$1,076,599	$298,637,642
2011	$7,556,978	$8,545,913	$988,936	$303,262,557
2012	$8,394,655	$9,494,625	$1,099,970	$306,161,296
2013	$9,446,511	$10,682,386	$1,235,875	$303,377,659
2014	$8,656,071	$9,788,899	$1,132,828	$304,615,618
2015	$8,975,316	$10,150,766	$1,175,450	$313,228,645
	*based on collections from January 1 – December 31. IRP Excess Compensation is distributed annually, in the calendar year following calendar year collected. License Tax is distributed monthly, in the month following the month collected.			
	** total of monthly license tax distributed only; does not include IRP Excess Compensation Distribution amounts.			

[7] Table courtesy of the ODPS Tax Distribution Section.

and townships in each county. The license tax distribution ratio (or excess compensation ratio) for each county dictates the amount of the county portion the county districts receive, and a similar calculation is used for the municipalities and townships, not including excess distribution. Years are calendar years, not fiscal years. The total IRP annual excess distribution averaged $9.8 million per year over the last decade, while total license tax distribution, on average, hovered around $306 million. Accordingly, the county portion of this tax has been approximately $8.6 million per year, which is the size of the pool that gets distributed to the counties. The rest of the IRP annual excess is distributed to other taxing districts (i.e., municipalities and townships).

While the municipal and township share (the total amount minus the county portion) would be distributed in exactly the same manner as it is currently, the county IRP excess share would be distributed in accordance with each county's percentage of out-of-state IRP registrations. For example, if a county had 1 percent of the 19,790 out-of-state registrations in 2014, it would receive $86,561 of the county share. The basic idea is that instead of allocating the county share based on existing distribution patterns, it would be used to address the IRP registration impact. The ODPS Tax Distribution Section would gather information about out-of-state registrations using Ohio's Commercial Vehicle Information Exchange Window (CVIEW) to compare the IRP-plated state to the mailing address trucking companies provide to the Federal Motor Carrier Safety Administration (FMCSA). Where the IRP-plated state does not match up with the mailing address, the company would be geocoded for a specific taxing district based on the address in the database so that the appropriate number of out-of-state registrations can be determined for each county, township and municipality.

Although the registration impacts have averaged $9.8 million per year to the counties, the county share of the IRP excess distribution has been less – $8.66 million, or 88.3 percent of the impacts. Even though the out-of-state registration impacts exceed the amount of IRP excess there is to distribute, this distribution mechanism ameliorates most of the impact. County engineers will want to look at this concept to see how well it addresses the issue in their specific jurisdiction. It is possible that using the mailing address does not sufficiently capture all of the commercial vehicles domiciled in their district.

The more pressing matter as it relates to these distribution mechanisms, however, is that there are tradeoffs when distributions are based on out-of-state registrations instead of the current IRP excess compensation distribution method. If the Ohio General Assembly opts to implement this distribution mechanism, counties will lose the excess compensation revenue they currently receive. It therefore becomes a question of whether the counties will receive more under the alternative distribution mechanism based on out-of-state registrations belonging to Ohio trucking companies. Figure 4 shows the net impact of replacing the current distribution mechanism for IRP annual excess with the registration-based distribution mechanism. The vast majority of counties (78) would experience a net loss in revenue in this situation. Ten counties would see gains, with gains greater than $1 million accruing to both

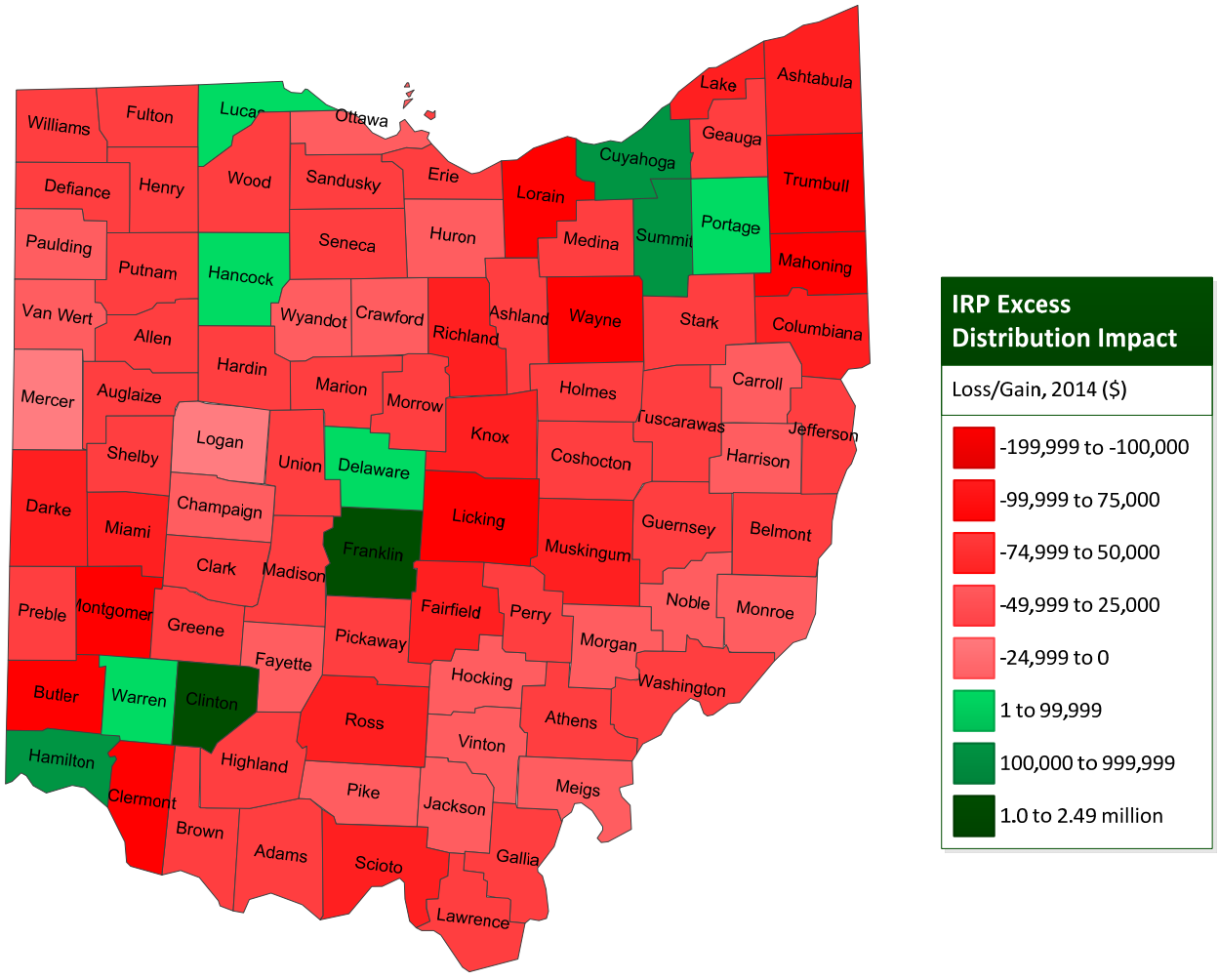


Figure 4. IRP Excess Redistribution by % of Out-of-State IRP Registrations

Clinton and Franklin Counties. Cuyahoga, Summit, and Hamilton Counties also see large net increases. Out-of-state registration impacts are clustered in more populous counties. Therefore, the general trend for this redistribution would be toward urban centers, and away from rural areas.

The challenge for county engineers who support this path forward is to convince those engineers in counties that would suffer net losses to accept a new approach to distribution. One mitigating circumstance might be that net losses are less than $50,000 in 20 of those counties, and that the maximum loss is $188,404, in Montgomery County. Given that the IRP annual excess is only a small fraction of the overall monthly license tax distribution, the annual excess county portion average from 2005 to 2015 was only 2.8 percent of the monthly license tax distribution. The impacts are stated in dollars, but the overall impact is actually quite small in terms of overall revenues that Ohio taxing districts receive. The other relevant point is that distribution laws were crafted upon Ohio's initial entrance to IRP, without knowledge of the various ways entering into such an agreement would impact revenue flows. No officials could have predicted the widespread popularity of jurisdiction shopping at the time of Ohio's entrance into IRP. However, with the problem concentrated in a small number of counties, broad-based remedies will always prove somewhat challenging for coalition building.

3.2 Redistribute IRP Annual Excess Using the County Business Patterns Data

One challenge associated with using out-of-state registrations as a distribution mechanism is that it may not adequately measure trucking activity within a sector. Distribution networks can be complex, and trucking companies do not necessarily centralize operations in a particular state or locality. Consequently, evaluating the level of economic activity can be challenging. An alternative to using the out-of-state registration approach would be to redistribute the IRP Annual Excess based on trucking industry activities from the CBP, which is an annual series of economic data organized by industry and maintained by the U.S. Census Bureau. Specifically, the data provide information on the number of employees, amount of payroll, and number of establishments in each U.S. county, broken down by North American Industry Classification System (NAICS) codes. For these distributions, the Truck Transportation category (code 484) is used. According to the Bureau of Labor Statistics, "[i]ndustries in the Truck Transportation subsector provide over-the-road transportation of cargo using motor vehicles, such as trucks and tractor trailers" (Bureau of Labor Statistics, 2016). Compiling, organizing, and releasing this data takes time, so ODPS Tax

Distribution Section employees would have to use County Business Pattern data on a two-year lag behind the actual revenues. For example, the 2014 IRP Annual Excess distribution would be based on the 2012 CBP data.

The first distribution based on CBP data leveraged the number employees who work in the truck transportation subsector in each county. We calculated each county's percentage of statewide truck transportation employees in 2012, and multiplied that by the county share of IRP Annual Excess distribution for the 2014 calendar year. Once those numbers were established, they were compared to actual 2014 IRP Annual Excess Distribution to determine the net impact for each county. Figure 5 shows what the net impact would have been had such a policy been in place. The

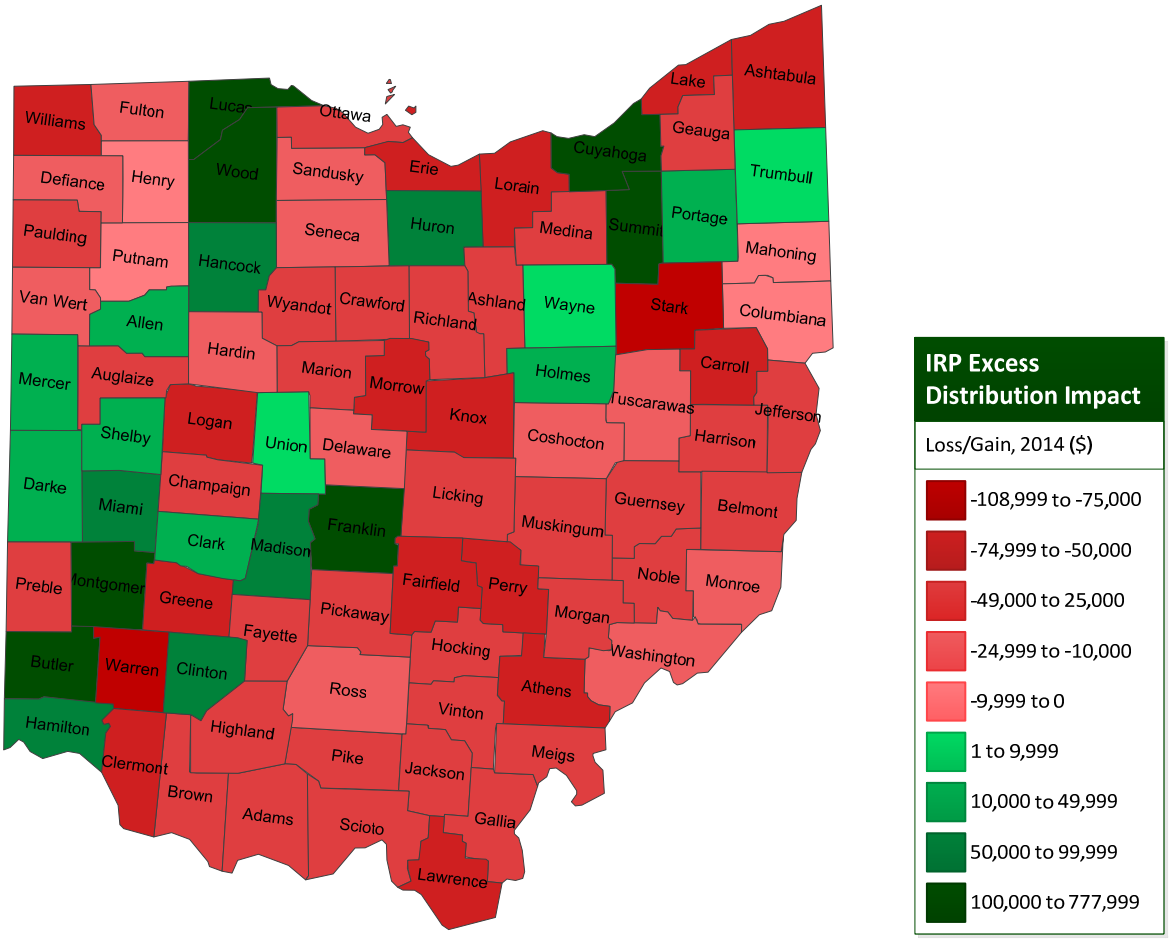


Figure 5. IRP Excess Redistribution by Number of Trucking Employees

map here differs from Figure 4, as there are more counties that would experience a net benefit. Specifically, there are 23 counties with a net gain, and 65 with a net loss. The difference is that

counties making large gains in the registration based distribution in Section 3.1 would not receive a net gain of the same magnitude. The maximum gain is less than $778,000, and the maximum loss less than $75,000. In this instance, most of the beneficiaries are located in the southwest and northeast corners of the state. These counties have smaller registration-fees-to-employee ratios than other counties in the actual IRP annual excess distribution.

The number of employees may not fully capture the operations of a business, as a large trucking company may employ people in managerial roles, administration, warehousing, or other non-driver jobs that may not provide the same measure of road impact. Furthermore, the CBP data redacts employment information in counties with a small number of individuals working in a particular sector, subsector, or industry, because releasing the information would reveal proprietary information about specific firms and their operations.

Another potential way to examine the distribution is to assess the amount of payroll each county pays to employees and managers in the county. Such a measure could potentially reward companies who have corporate headquarters or a large presence in a county by providing its county engineer with an infusion of additional IRP revenues. This measure could potentially be used by state and local officials to incentivize companies to retain payroll or investments by trucking firms. County officials might even want to earmark some funds for infrastructure upgrades requested by trucking firms. Figure 6 shows the net impact of switching to payroll-based IRP Annual Excess distribution. The results are very similar to the ones for the employee-based distribution model. Whereas there were 23 counties with net gains in the employee-based model, there are 21 counties with net gains in the payroll-based distribution model. The difference is that both Wayne and Clark counties had net gains in the employee model, but net losses in the payroll model. Like the employee model, the payroll model impacts do not have the range of the out-of-state registration model. The largest gain is Franklin County, which would receive $718,596 in additional revenue. The largest loss is Warren County, at $110,298.

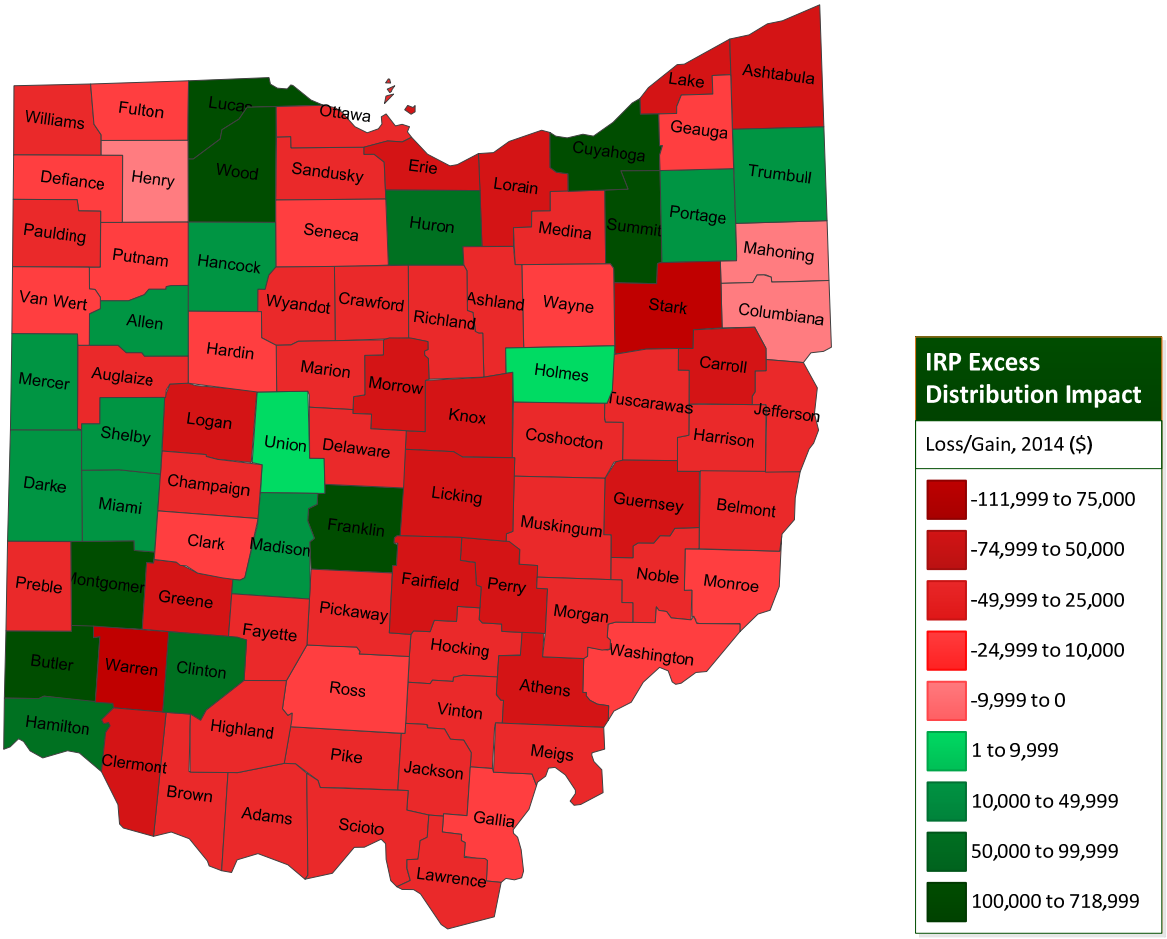


Figure 6. IRP Excess Redistribution by Annual Trucking Payroll

The final distribution looks at the number of establishments in each county as a percentage of all truck transportation subsector firms as reported by the CBP data. In this distribution mechanism, each establishment is counted the same regardless, for example, of its number of employees or payroll. In other words, there is a kind of parity between establishments that equally weights each business. A small business with a single employee will entitle a county to just as much revenue as a large business with hundreds. As with the other CBP-based models, this approach is subject to data redaction and noise reduction methodologies. Figure 7 displays the net impact of switching from the current annual excess model to an establishment-based distribution system.

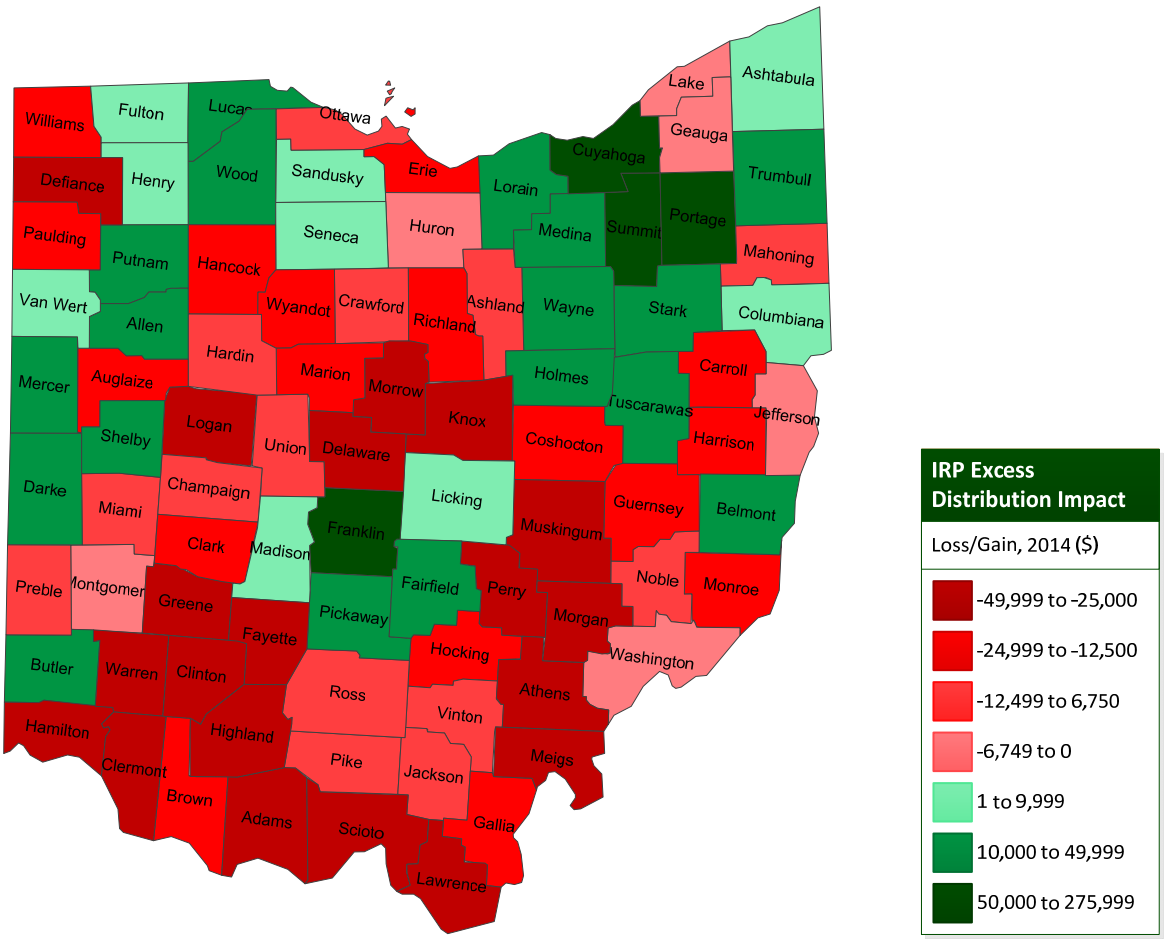


Figure 7. IRP Excess Redistribution by Number of Establishments

This model has two significant advantages over the other IRP Annual Excess distribution mechanisms utilizing the CBP data. First, the number of counties with net gains and losses are more balanced with this approach than the other CBP models. In this model, there are 31 counties with net gains compared to 57 with net losses. Second, the magnitude of those losses is quite small – the largest impact is Athens County, at $46,744. The largest gain is to Cuyahoga County, which would see an increase of $275,247. So the gains and losses are significantly smaller. However, it also means this distribution technique is much less efficient at rectifying the IRP out-of-state registration impacts than other CBP-based distributions. County engineers will ultimately have to identify the best strategy to balance these often competing goals as they address IRP jurisdiction

shopping and the impacts on registration revenues. This solution will be less appealing in counties with large registration impacts, such as Clinton and Franklin Counties – but it may represent an acceptable step in the right direction for all parties involved.

3.3 IRP Distribution by Hybrid Out-of-State Registration and Current IRP Annual Excess

Another mechanism that might balance competing interests is a hybrid system that provides two distinct distribution mechanisms. Half of the county portion could be distributed based on the number of out-of-state registrations matched using Ohio's CVIEW data. To maintain continuity with current practices, the other half of the county portion could be distributed in accordance with current state law. Such an attempt to balance competing interests may be the easiest way to build consensus around addressing jurisdiction shopping while alleviating fears that changes will be costly for counties that currently enjoy an advantage due to current distribution practices. Using the example from the 2014 IRP Annual Excess distribution, the $8,656,071 comprising the county portion of the IRP annual excess would be split in two, with approximately $4.3 million going to the out-of-state distribution described in Section 3.1, and the other $4.3 million distributed using the IRP distribution mechanism detailed in Phase I.

Figure 8 shows the net impact of the hybrid distribution system. The distribution impact map looks fairly similar to the out-of-state distribution map in terms of net gains or losses. There are two differences. Lucas County saw net gains under the out-of-state distribution, but faces a net loss under the hybrid distribution mechanism. Conversely, Logan County showed a net loss under the out-of-state distribution but gains under the hybrid distribution. Ranges run from $103,173 in net losses for Montgomery County to a $1.69 million gain for Clinton County. Overall the impacts are very similar for the hybrid and out-of-state systems, although the range for the latter is wider. This balancing mechanism addresses the out-of-state registration impacts more effectively than preserving the current system.

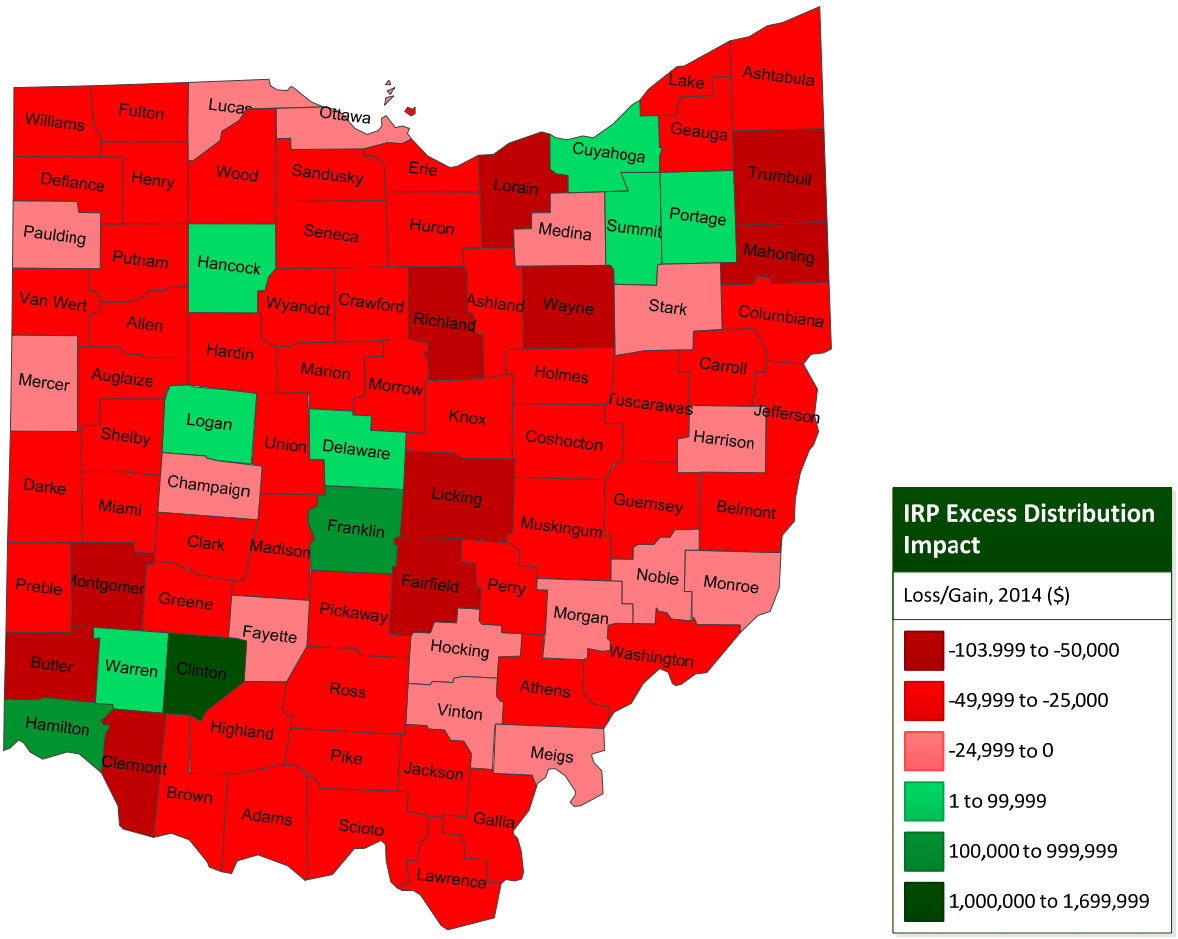


Figure 8. IRP Excess Redistribution Hybrid: OOS Registrations and Current Distribution

3.4 Forecasts of IRP Annual Excess Distributions

All of these distributions reveal important information about how a one-year distribution might look. However, we know these distributions will be dynamic, fluctuating annually based on economic trends, trucking industry trends, and other factors. To obtain a comprehensive picture of multi-year impacts, we examined several forecasts for the IRP excess distribution options detailed previously. A discussion of forecasting models and their applications in the social sciences was included in Phase 1 of this research (p. 47-49). To avoid redundancy, we do not reproduce the same discussion here. Rather, we note that the same concepts are applicable to these forecasts as well.

The first forecast is a continuation of current policy. County distributions were based on the assumption that the IRP excess distribution method will not change. Actual county distributions from 2009 to 2015 were used as historical data to generate the forecasts for 2016 through 2020. Given the uncertainty in forecasting, maintaining a five-year forecast provides a greater level of confidence than longer-term forecasts.

Next, we forecasted the results for the four alternative distribution options. These were:

- Distribution based on each county's percentage of out-of-state registrations tied to trucking companies based in Ohio
- Distribution based on each county's percentage of trucking industry establishments as reported by the Census Bureau's County Business Patterns (CBP)
- Distribution based on each county's percentage of trucking industry payroll as reported by the Census Bureau's CBP
- Distribution based on each county's percentage of trucking industry employees as reported by the Census Bureau's CBP

In Phase 1 we applied several linear forecasting models, such as a time trend, time trend squared, and lag model, to the distributions using the percentage of trucking industry payroll and employees as reported by the Census Bureau's County Business Patterns. When conducting the analysis, we encountered several problems. In some cases, counties had employees and payroll reported in some years while in other years those values were zero, indicating that either companies had left the county or the data were not reported. Data may not be reported when the industry sample is small, because they may reveal proprietary information about a business's operations. To generate forecasts for these options that did not yield negative, and thus unrealistic, results for outlying years, a seven-year moving average was utilized. A weighted average uses the mean of a specified time period to forecast the next value in a time series. To capture all seven years of initial data, a seven year moving average was chosen, as indicated in Equation 1. While moving averages are generally more conservative estimates, they smooth out fluctuations present in the County Business Patterns data.

$$Y_t = (Y_{t-1} + Y_{t-2} + Y_{t-3} + Y_{t-4} + Y_{t-5} + Y_{t-6} + Y_{t-7})/7 \qquad (1)$$

Where Y_t is the distribution in year t, Y_{t-1} is the distribution in the preceding year and so on. To maintain methodological consistency across all forecasts, the seven-year moving average was used for all forecasts. Specific forecast information is included in the supplementary Excel file.

Table 6 shows the projected county share of the statewide IRP Annual Excess distribution for CY 2016-2020. The overall projections are somewhat conservative for reasons previously explained. What these calculations show is that after an initial decline of just under $29,000 between CY 2016 and CY 2017, in CY 2018-CY 2020, there is a slow upward trajectory where total revenues increase by $242,684 over that three-year period. The change between 2015 and 2020 is actually somewhat regressive, as the actual 2015 numbers are $8,975,316. The overall change for the 5-year period following the latest available numbers is a decline of 2 percent. The fluctuations have minimal impact at the local level, especially considering there are 88 counties that split IRP annual excess revenue. This level of revenue is what we project will be shared by counties regardless of the distribution mechanism chosen. Therefore, the total amount of revenue distributed is the same for each distribution type, although impacts among counties will differ for each.

Table 6. Projected IRP Annual Excess, 2016-2020

Year	County Portion
2016	$ 8,577,593
2017	$ 8,548,697
2018	$ 8,593,688
2019	$ 8,741,790
2020	$ 8,791,381

Figure 9 shows the net change in revenues for the actual amount received by each county in CY 2015 and the projected receipts in CY 2020 under the current IRP annual excess distribution mechanism. There are no errors in the map (despite its uniform appearance). Not a single county in the state sees net revenue change by more than 10 percent. IRP annual excess revenues are projected to be fairly static, particularly at the county level, under the current IRP annual excess distribution mechanism. Counties can expect to receive approximately the same level of funding they do currently. Several factors that could undermine the current forecast. First, there could be

additional shifts in jurisdiction shopping and registration patterns. There could be more Ohio-based registrations, which would yield more revenue to the county of domicile. Or there could be more out-of-state registrations, and more funds ultimately directed into the excess compensation fund. Economic depression or recession could alter the amount of truck registration revenue. Any state action that alters the manner in which vehicle registration revenues are disbursed could also have a more pronounced impact than currently anticipated. However, given the information currently available to us, these projections are quite realistic. The status quo looks fairly static.

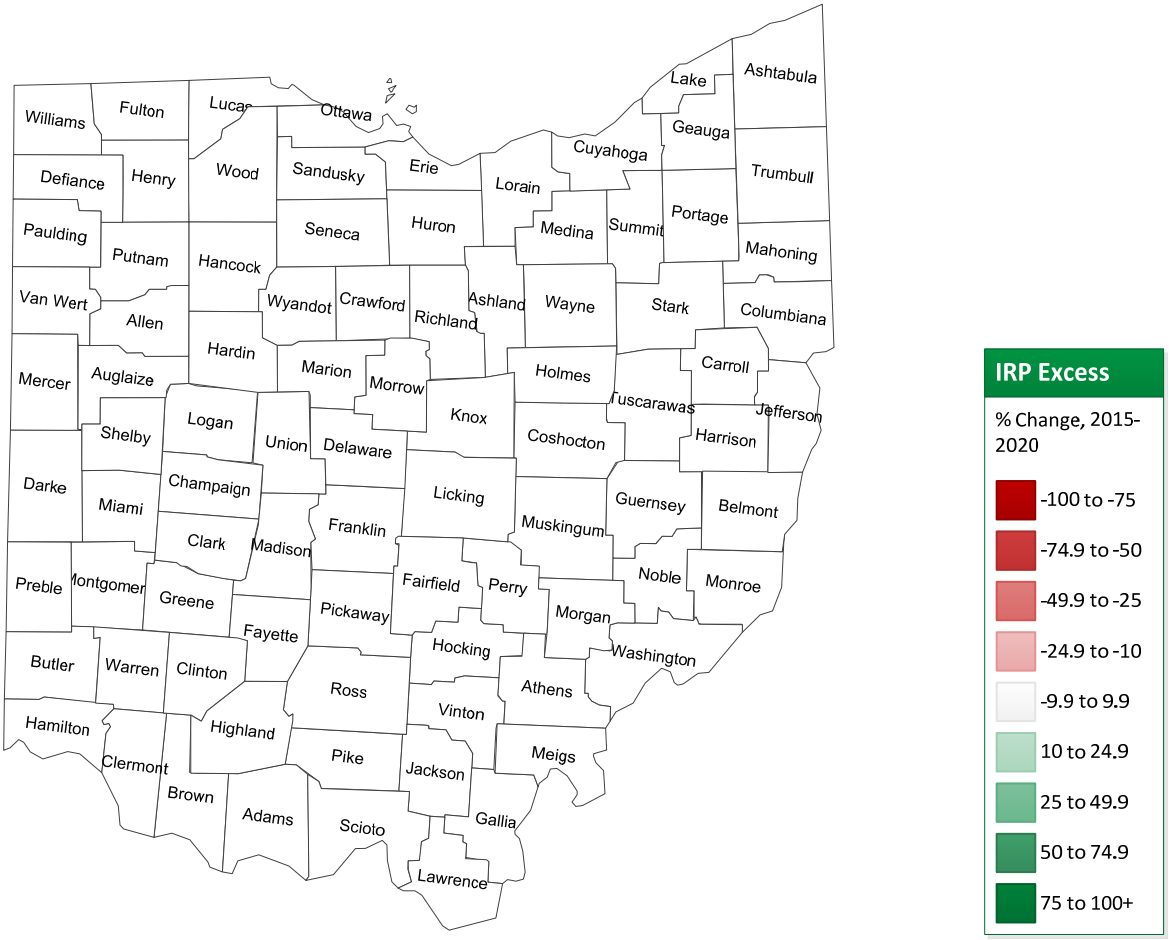


Figure 9. Current IRP Annual Excess, Projected Change (2015-2020)

Next, the research team decided to create projections for the other redistribution mechanisms detailed in sections 3.1, 3.2 and 3.3. The first projection relates to the out-of-state registration based distribution, and how that projection would impact revenue in future calendar

years. These hypothetical distributions have one important limitation, however. The distributions are based on 2014 out-of-state vehicle registrations because historical out-of-state vehicle registration data were not available. The actual distribution would differ if the actual year-by-year registration data were available. The actual county portion of the IRP annual excess for each year from 2009 to 2015 is available in the Phase I deliverables for this project.

Figure 10 displays the projected revenue based on a hypothetical situation in which IRP annual excess was distributed according to the alternative, out-of-state-registration-based mechanism since 2009. The percent change compares the actual value of the 2015 distribution under the current distribution mechanism to the 2020 distribution under the out-of-state registration mechanism. In all but 10 counties the losses exceed 10 percent; in most counties the

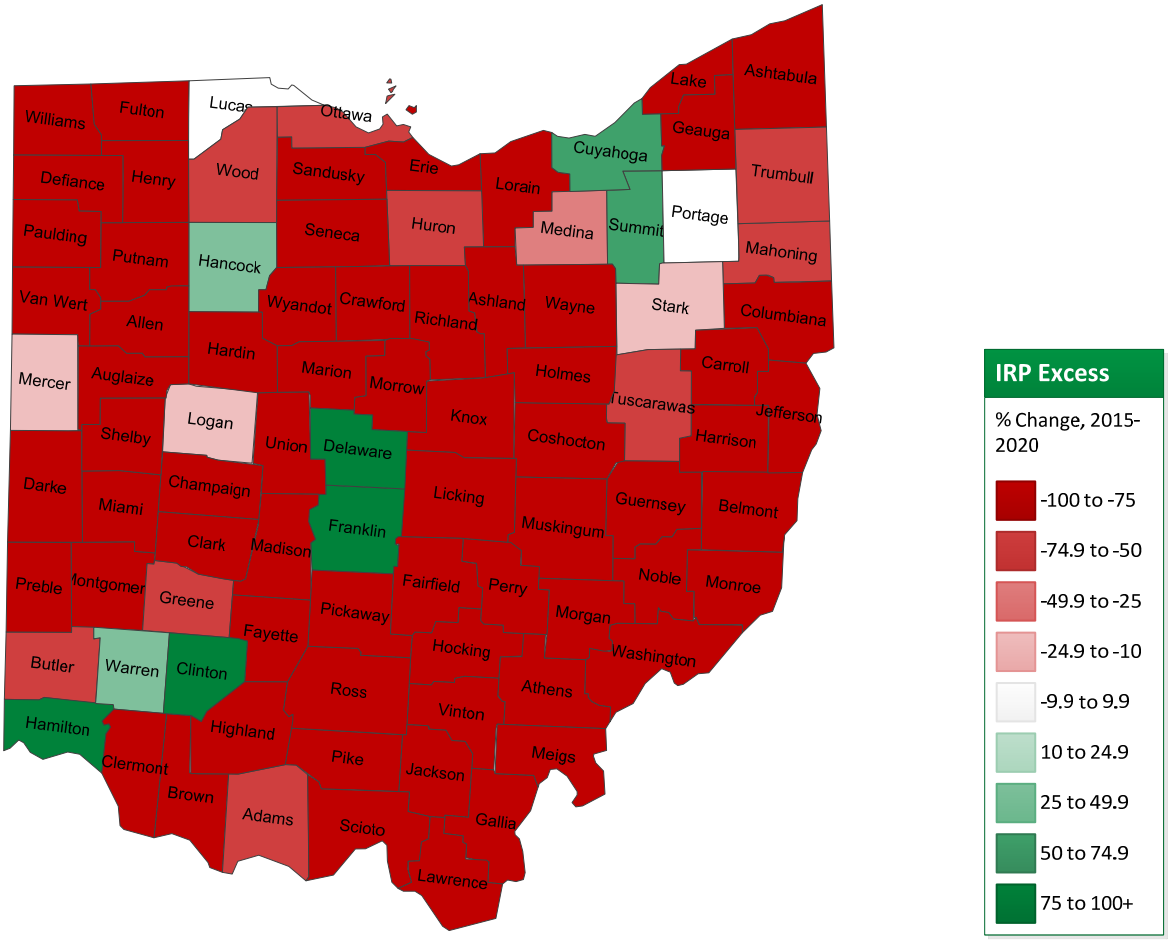


Figure 10. Out-of-state Registration Redistribution Projections, %Change (2015-2020)

losses are quite large as a percentage of IRP annual excess funds received (although not a large percentage of overall registration fees). This again reflects that jurisdiction shopping is not evenly distributed across the state. In seven of the 10 counties where the out-of-state registration impact is concentrated most heavily, the permissive motor vehicle tax is $15. Motor carriers have cited this (among other things) as a reason for jurisdiction shopping, as the permissive local tax makes local registration a more expensive option than it would be otherwise.

Figure 11 displays the projected future revenue impacts for the CBP employee-based redistribution mechanism discussed in Section 3.2. These projections assume the use of employee

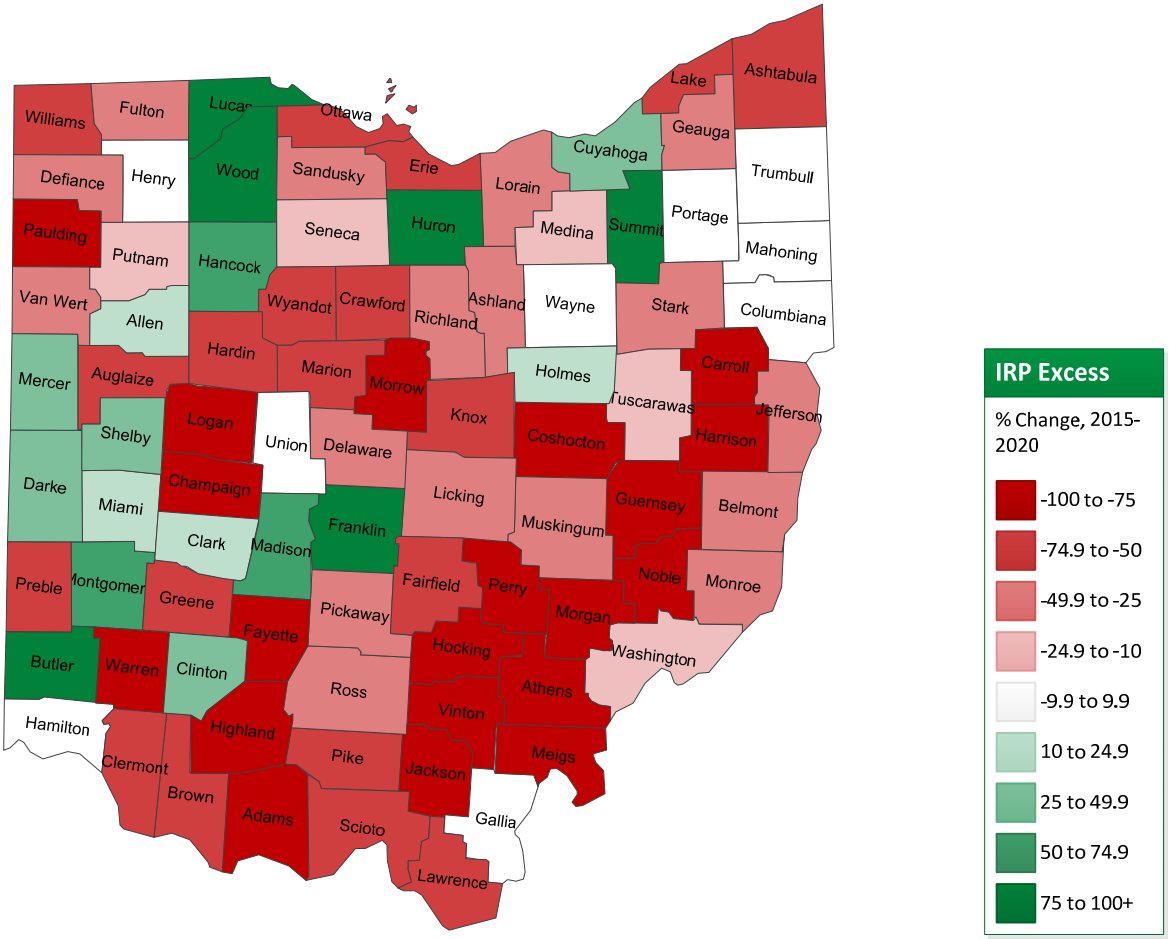


Figure 11. CBP Employee Redistribution, % Change (2015-2020)

metrics from the Census Bureau's CBP to calculate the county share on a two-year lag. In other words, the 2007 CBP employee metrics were used to calculate the 2009 distribution, the 2008 CBP

was used for the 2010 distribution, and so forth. These distributions were used to forecast future distributions, albeit without the benefit of knowing what the CBP data will look like. The results show that 66 counties will suffer a net loss of revenue during this period, with losses greater than 50 percent for 39 of those counties. On the other hand, there will be 22 counties that see a net increase in IRP annual excess revenues during this time.

Figure 12 displays the projected future revenue impacts for the CBP payroll-based redistribution mechanism discussed in Section 3.2. These projections assume the use of payroll

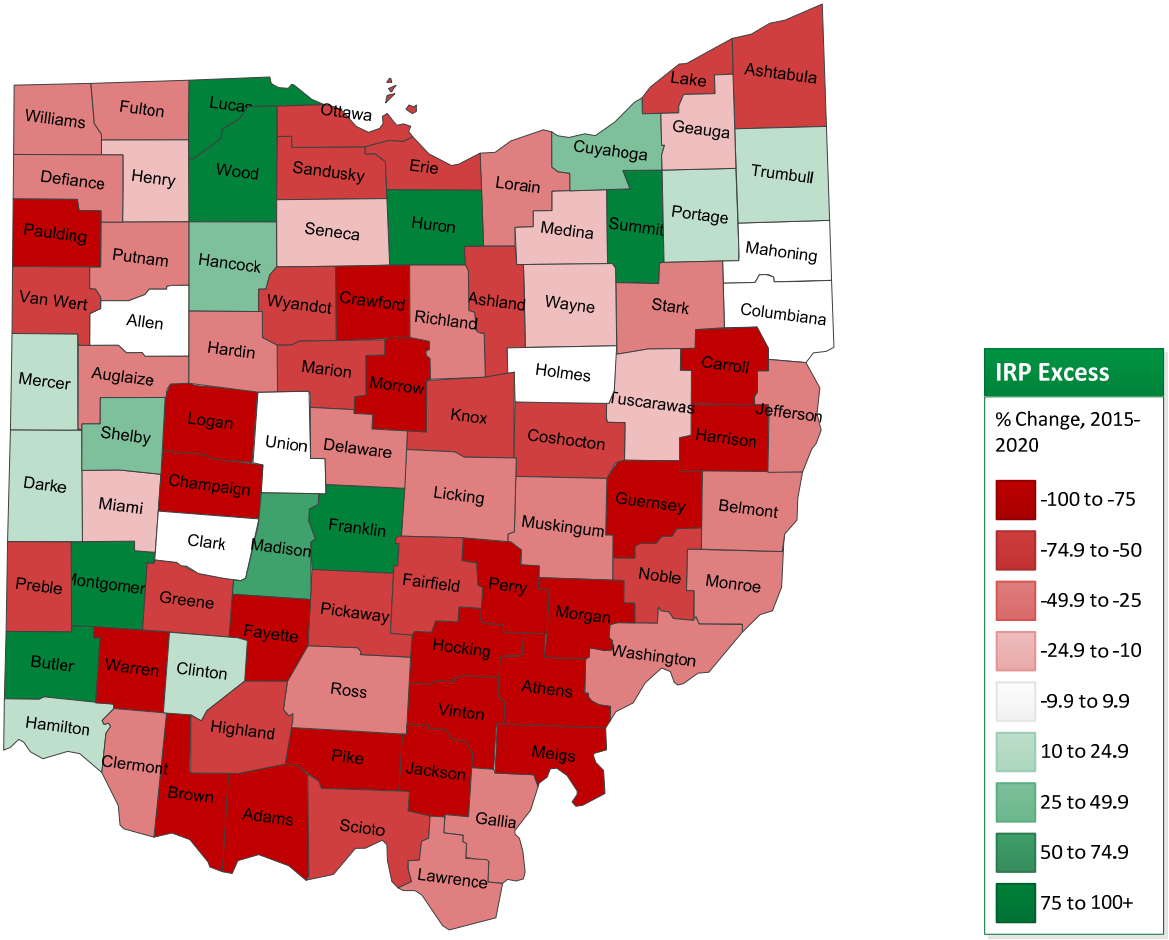


Figure 12. CBP Payroll Redistribution, % Change (2015-2020)

metrics from the Census Bureau's CBP to calculate the county share on a two-year lag. The 2007 CBP payroll metrics were used to calculate each county's share of IRP annual excess in 2009, and so forth, in the same manner as the employment distribution mechanism. Each county's share of

the total by its percentage of statewide trucking payroll share for 2009 to 2015. The dataset was used to create the 2016-2020 forecast. The results show that 68 counties will experience a net loss of revenue during this period, with losses greater than 50 percent for 38 of those counties. Twenty counties will see a net increase in IRP annual excess revenues during this time. The distribution impacts are quite similar to the employment-based distribution forecasts.

Figure 13 displays the projected future revenue impacts for the CBP establishment-based redistribution mechanism discussed in Section 3.2. These projections assume that establishment

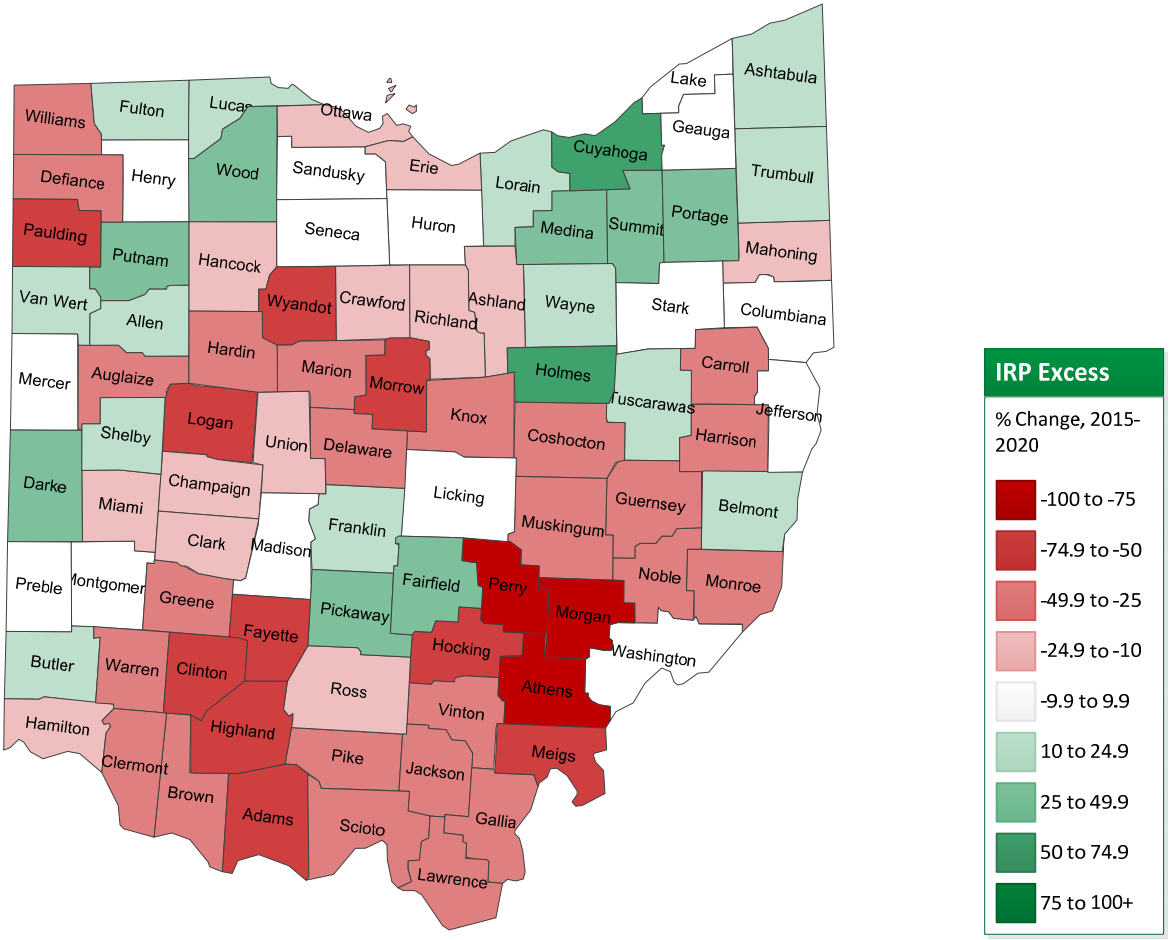


Figure 13. CBP Establishment Redistribution, % Change (2015-2020)

counts in the truck transportation subsector from the Census Bureau's CBP will be used on a two-year lag. The 2007 CBP payroll metrics were used to calculate each county's share of IRP annual excess in 2009, and so forth, in the same manner as the other CBP distributions. Each county's share of the total was determined by its share of statewide payroll for 2009 to 2015, and that data

was used to create the 2016-2020 forecast. The results show that 58 counties would have a net loss of revenue under this scenario, but in most cases these losses would be smaller. Only 13 counties would lose more than 50 percent of their IRP annual excess distribution. Under this distribution, however, 30 counties would see a net gain between 2015 and 2020.

3.5 Factors to Consider

Redistribution of the IRP annual excess is a fairly equitable way to address IRP jurisdiction shopping, which impacts county road funds when Ohio trucking companies shift registrations (but not operations) to other states. This section identifies multiple alternative distribution mechanisms for the IRP annual excess based on registration impacts or measurable economic activity related to the trucking industry. An alternative distribution is arguably a more equitable distribution of IRP revenues, as the loss compensation covers the local taxing district loss related to apportioned registrations. The IRP jurisdiction shopping impact was not predicted at the time of Ohio's entrance into IRP, but it is also a distortion of truck registration revenues in that some taxing districts receive little money from the companies operating on their roads.

The redistribution of the IRP annual excess revenue is a good starting point because it is distributed annually, depending on how much IRP compensation funds are left after all loss compensation, administrative costs, and other deductions have been made. In addition, the 2014 IRP annual excess pool is about 88.3 percent of the estimated impacts for Ohio counties, so most of the registration impact can be mitigated. The section provides five distribution options for county officials to consider before submitting a proposal to the Ohio General Assembly. The out-of-state registration-based distribution mechanism is the most direct way to address the impacts noted in Phase I of the study, but other distributions that take employees, payroll, or number of establishments into effect may be more equitable to all concerned.

There are some shortcomings to this strategy. In each instance, there are more counties with net losses than net gains. Forecasts of future projections show these effects will be persistent. Another issue is that Ohio does not control the maintenance of IRP registration data or CPB data. County officials would have to rely on registration data from other states, or Census Bureau data that is released based on federal government timelines. The CPB data is often redacted for smaller counties to avoid revealing proprietary information about a specific business, and the inability to get that data will impact distributions to small counties. Furthermore, the CPB-based distributions

are not directly modeled on the impact that county officials are trying to address. In this sense, it is a less efficient mechanism to redress the impacts. Essentially, these distributions can mitigate the out-of-state IRP registration impact, but not erase 100 percent of all estimated impacts for counties. Nor do they address effects to townships or municipalities. And funds appropriated in this manner would concentrate IRP annual excess distribution in fewer counties where the registration impacts are concentrated.

Strategy 4: Increase County Permissive Taxes

County engineers have been forthcoming with the research team in their assessment that convincing motor carriers to voluntarily repatriate out-of-state IRP registrations is easier said than done. Trucking companies usually have valid reasons for their plating strategies, and getting companies to repatriate when they enjoy certain advantages offered by other states can be difficult. Convincing state legislators to change the laws governing the allocation of IRP revenue can also be challenging. However, local officials do have some leeway to address revenue issues by instituting motor vehicle permissive taxes in their county. In 1967, the Ohio General Assembly granted local governments the authority to enact a permissive motor vehicle tax of $5 per vehicle, with the stipulation that funds be used for highway-related purposes (County Commissioner's Association of Ohio, 2013). A second and third permissive vehicle tax were authorized in 1987. Townships and municipalities can also enact a $5 progressive motor vehicle license tax, which brings the maximum allowable permissive license tax to $20 within a specific taxing district. There are, however, a number of prohibitions and restrictions on how many permissive taxes can be enacted, depending on the history of previous enactments in specific municipalities, townships and counties. The distribution of each of the three $5 taxes counties can enact are different.

Table 7 describes permissive taxes, their year of enactment, manner of allocation and amount of tax for counties (municipalities and townships not shown). The original tax is deposited to municipalities upon application, with remaining fees deposited into the county motor vehicle license and gas tax fund. For the second permissive tax, 50 percent goes to the municipality if the registered vehicle belongs to someone residing or operating a business there, or 30 percent if in a township. The remainder goes to the counties. With the third tax, 30 percent goes to a township if in a township, with the rest to the counties. If the vehicle is in a municipality, the county receives the entire amount. There are some limitations. For example, if a county repealed the original tax

after 1987, it cannot reinstitute it. New taxes must be enacted by county commissioners, and are subject to a referendum if challenged during the first 30 days after enactment. Counties where there were municipalities with pre-existing permissive taxes are also subject to some restrictions.[8]

Table 7. Ohio Motor Vehicle Permissive Tax Enactment, Allocation and Amount

Tax	Year	Allocation	Amount
Original	1967	Deposit to municipalities upon application, remainder deposited into county motor vehicle license and gas tax fund	$5
Second	1987	50% if in municipality, 30% if in township, remainder to the counties	$5
Third	1987	30% if in township, rest to county	$5

Figure 14 shows the number of county motor vehicle permissive taxes each county has enacted as of 2016. There are 24 Ohio counties with no motor vehicle permissive tax, 21 counties with one motor vehicle permissive tax, 13 counties with two motor vehicle permissive taxes, and 30 counties with all three motor vehicle permissive taxes. These laws are generally more common in counties with larger populations (which tend to have larger registration numbers). In fact, 59.2 percent of all out-of-state IRP registrations are in counties where all three motor vehicle permissive taxes are already in place. Another chunk (29.4 percent) of the registrations are in Clinton County, which has only enacted one permissive tax. As such, those two categories cover 88.5 percent of registrations. So the option of authorizing permissive taxes presents a significant opportunity for Clinton County – the most impacted county in the state – and some rural counties that have not enacted some or all of the motor vehicle permissive taxes. In counties where this has not occurred, it is worth advocating that county commissioners explore whether enacting these taxes will help county engineers meet their infrastructure investment and maintenance needs. However, in many counties, there are no remaining permissive taxes to enact. These counties will have to rely on other strategies to generate the revenue necessary to offset the effects of lost IRP registrations.

[8] Ibid.

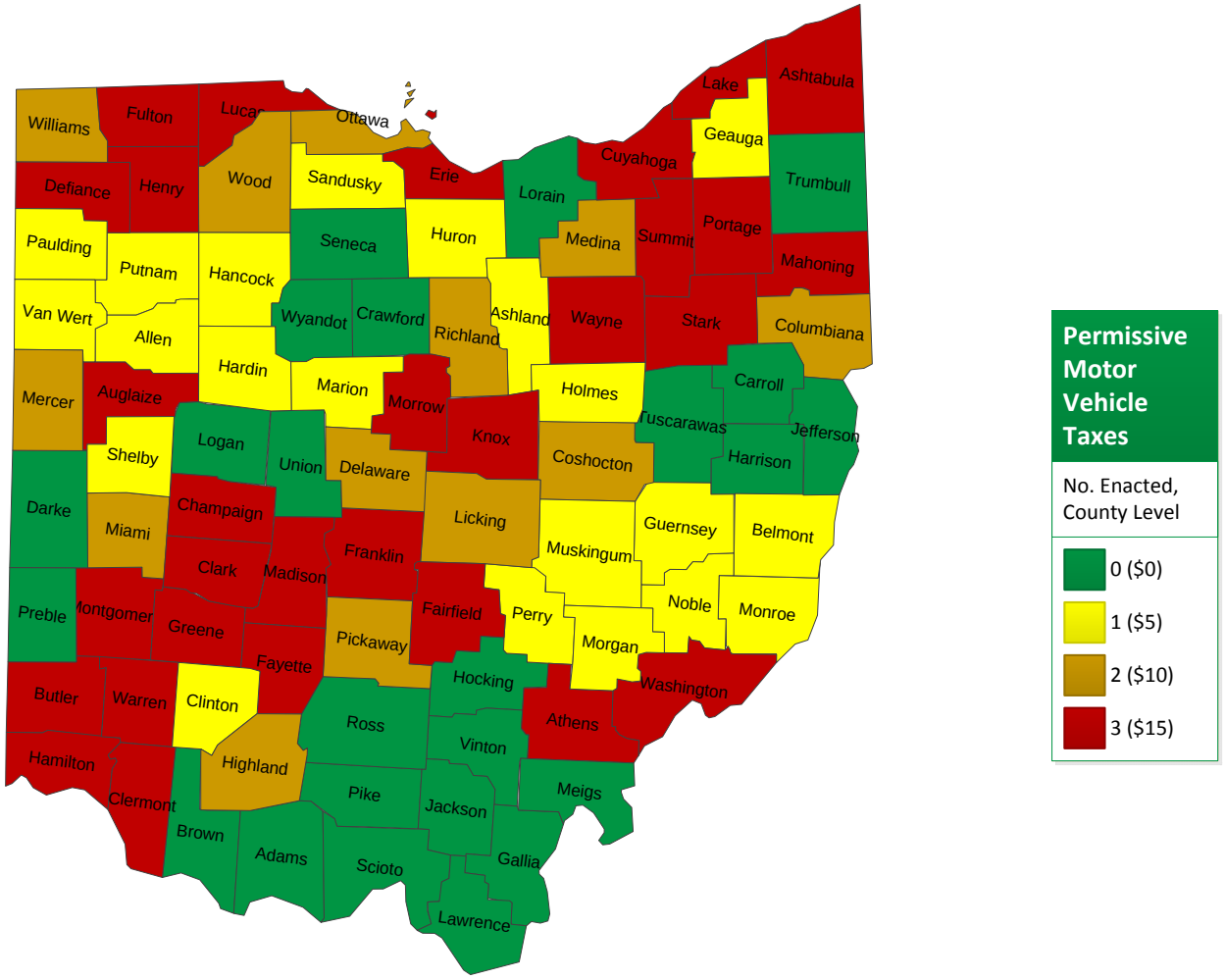


Figure 14. Ohio Permissive Motor Vehicle Taxes Enacted by County, 2016

4.1 Factors to Consider

There are several potential benefits to utilizing motor vehicle permissive taxes to generate additional revenue. It does not require action by the Ohio General Assembly. Thus, local officials will have greater control over their own destiny. County engineers with the need and the ability to persuade county commissioners to enact the progressive tax option will have a significant revenue generation tool that can be applied to a variety of highway transportation costs in their jurisdiction. The permissive tax would apply to all motorists in the county, so the impact would be broadly distributed. A permissive tax might not fix all of the problems, but it could be one component of a larger reform package aimed at redressing IRP out-of-state registration impacts.

On the other hand, permissive motor vehicle taxes have been maxed out in several areas where there is substantial out-of-state IRP impact. These taxes, which are sure to have political

detractors, must be approved by the county board of commissioners, which may not be sympathetic to the goals of the county engineer. Citizens are almost certain to weigh in as well, given that the law states taxes can be subject to a referendum if they are challenged within 30 days of passage. Furthermore, the permissive tax shifts the tax burden to all motorists, and not just trucking companies. This may complicate the political narrative and make it more difficult for the law to win commission support or voter approval.

Strategy 5: Increase Ohio IRP Plate Fees

Another strategy Ohio officials might try is looking at a possible increase in IRP registration fees. The previous strategies all focus on working within the existing system or reallocating existing resources. This strategy changes the focus to locating and collecting new resources to help Ohio counties maintain roads that are highly susceptible to the wear and tear. Ohio IRP fees have been the same since October 1, 2009, when they were increased by roughly 2.5 percent for all weight classes. Table 8 shows the amount of Ohio IRP revenue, out-of-state Ohio IRP revenue, total IRP revenue, and the adjusted out-of-state impact as calculated in the beginning of this study. The total revenue was just shy of $100 million, with about three quarters of this coming from out-of-state revenue. Here we assume the most desirable approach is to generate the revenue necessary to address jurisdiction shopping in a way that does not negatively impact revenues that Ohio counties currently enjoy. This would mean earmarking all new revenue for a special account that would be used to address the out-of-state IRP impacts.

Table 8. Ohio IRP Revenue, and Impact Calculations (2014)

Revenue Category	Amount
Ohio IRP	$23,828,117
OOS IRP	$75,522,268
Total IRP	$99,350,385
OOS Impact	$9,799,058
Impact Ratio	1.0986
Current Plate	$1,370.00
Increase Plate	$1,505.12

The next question for decision makers, particularly lawmakers in the Ohio General Assembly, will probably concern the impact of such an increase on Ohio's IRP registration fees

relative to surrounding states. Table 9 shows the IRP fees applicable to an 80,000-pound truck for a 12-month registration (though the specific weight classes vary by state). This also assumes no apportionment, so a vehicle would only be assessed this fee if they ran 100 percent of their miles in one state. Otherwise it is prorated based on annual operating miles. Indiana has the cheapest plates by far – $956 per plate. Next is West Virginia, at $1,131.25. Ohio is currently in the middle of the pack, with a plate that is $40 less than Kentucky. Michigan and Pennsylvania have the highest plate fees of any border states. If Ohio were to increase its plate fee to $1,505.12, it would pass Kentucky in plate fees but otherwise its place along the cost spectrum would not change, at least not vis-à-vis Ohio border states.

Table 9. Current IRP Fees for Ohio and Surrounding States

State	IRP Plate
Indiana	$956.00
West Virginia	$1,131.25
Ohio (Current)	$1,370.00
Kentucky	$1,410.00
Ohio (Proposed)	$1,505.12
Michigan	$1,660.00
Pennsylvania	$1,925.00

5.1 Factors to Consider

This approach has a significant advantage over all previously reviewed strategies: it does not require any counties to endure net revenue losses from the IRP annual excess. It also addresses all of the out-of-state IRP revenue displacement from a recent point in time, and could be tweaked using the latest data to determine a closer fit, or even a fixed amount that would be agreeable to state and county officials. Legislation and regulations promulgated concerning the administration of this new IRP Registration Displacement Fund should be explicitly earmarked for county road maintenance and local highway infrastructure investment for counties with out-of-state IRP registration impacts. County officials will have to make persuasive cases to state lawmakers about the need for revenue infusion. Specific examples about infrastructure requests from the trucking industry for repaving, new stoplights, or other crucial infrastructure should be collected, along with estimated costs, to clearly demonstrate a need for the revenue.

IRP plate fee increases are unlikely to be popular with the motor carrier industry. Ohio has made some strides in this regard, but Indiana's registration system stands out (see Chapter 4). The other problem is that the solution will effectively shift the impacts of jurisdiction shopping away from the carriers engaging in the practice to the entire trucking community. This strategy could raise questions for companies that feel they should not be penalized for the actions of others.

Strategy 6: Dedicated Revenue Stream

Another strategy would be for county officials to simply request a direct appropriation from unobligated state funds to address the impacts of jurisdiction shopping on registration revenue distribution. Given the concentration of this phenomenon in urban areas with higher permissive taxes, and the fact that the more rural counties might be reluctant to give up IRP annual excess distributions, a permanent, dedicated appropriation from another revenue stream to counties based on out-of-state registration impacts may be the most palatable solution for all stakeholders, including industry. This share would have to come out of the state's own revenues, as federal funds typically entail statutory or regulatory restrictions or dedicated use. Further research is necessary to identify the correct funding stream for this strategy; it will need to come from a source with no federal or state restrictions.

6.1 Factors to Consider

One obvious benefit of this strategy is that it does not require a redistribution of current local resources, creating less friction between parties with divergent incentives. The dedicated revenue stream would address IRP impacts based on current revenues – there would be no lag as there would with CBP-based redistribution. It could be adjustable and indexed to a percentage of an appropriate revenue stream, which would let it fluctuate along with state revenues. Overall, county engineers would have more resources to dedicate to highway infrastructure construction and maintenance. Only a dedicated revenue stream avoids redistributions with net gains and losses, and avoids the potential opposition of the trucking industry because of IRP fee increases.

There are some challenges, however. A dedicated revenue stream would reduce the overall availability of funding for state programs/initiatives. The devolution of some state transportation funds for local control could present other logistical, regulatory, planning and resource challenges. It does not address the impacts to municipal or township taxing districts, although it could be modified to include those effects. Doing so would increase the funding need from $9.8 to almost

$13.2 million. Another factor to consider is that this approach does not address the negative externalities, which drive the current issue. Out-of-state registrations would still be quite prevalent, and there may be other challenges such registrations pose for future issues related to taxation, regulation, economic development and revenue allocation.

Chapter 3: Marketing Strategies

In order to publicize past and future efforts to modify registration processes, as well as any other changes that are implemented based on the recommendations of this study, it will be critical for Ohio officials to develop marketing strategies. Such strategies will increase the visibility of efforts by state and local officials to improve the registration process for IRP within Ohio. If legislative or other changes to the IRP process are made, these will also need to be publicized. Ideally, such marketing efforts, particularly those focused on changes made to improve the registration process, will encourage trucking companies based in Ohio to repatriate any out-of-state IRP registrations. We review some general marketing information, such as the difference between public- and private-sector marketing, and how those marketing efforts generally function. Depending on the strategies chosen, the information reviewed may or may not be applicable. Regardless, it contextualizes the discussion of how particular marketing strategies may be used to reach target constituencies.

Marketing is defined by the American Marketing Association as "the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large."[9] Snaveley (1991) defined the mission of marketing for the public sector as policy implementation. Marketing functions as listed by Coffman (1986, p.11) are: customer service, research, advertising, sales promotion, public relations, and distribution. The marketer's job is to orchestrate these functions and their output in a way that achieves the two-way link with the customer and the right service to the right markets at the right price by the right means at the right time.

Public sector marketing has become increasingly important as many public sector activities often require it to make the general public aware of issues and to develop potential solutions. Hintz, Church, and Colterman (2006) cited the challenges of meeting mandates/satisfying clients with fewer resources and meeting revenue or cost-recovery metrics as reasons behind governments' adoption of marketing strategies. European countries have been using marketing to sell policy, recognizing that citizens are also customers (Cousins 1990). In the U.S., basic marketing functions for tourism and economic development have long been part of many public agencies'

[9] https://www.ama.org/AboutAMA/Pages/Definition-of-Marketing.aspx

responsibilities (Walsh 1994). "Major advertising campaigns are common when government wants to promote a particular initiative" (Walsh, 1994, p. 65). Lamb (1987, p. 57) cited four factors that led to an increased interest in public sector marketing:

- Decrease in public participation and customer satisfaction;
- Increased competition;
- Decreasing numbers of consumers in many traditional target markets; and
- Increased dependence on fees and charges to clients in order to defer operating expenses.

Adding elements of privatization to government operations – the client fee/user charge noted by Lamb – has also led to increased focus on marketing in the public sector (Graham 1994). Additionally, increasing responsibility for service provision and competition (as noted by Lamb) from other public and private providers has driven the popularity of public sector marketing (Bouzas-Lorenzo 2010; Walsh 1994). Governments can also use marketing to help meet mandates and serve constituents under resource constraints (Madill 1998).

Public sector marketing may in many ways resemble private sector efforts. Serrat (2010, p. 4) noted that the public sector has adopted many private sector approaches to marketing:

Private sector tools, methods, and approaches have already been adopted in the public sector. (Monitoring and evaluation figures prominently.) But many public sector organizations – especially not-for-profit – are realizing that strategic marketing can help address two challenges: the challenge of meeting mandates and satisfying stakeholder needs in the face of diminishing resources, and the challenge of meeting specified revenue or cost-recovery targets.

Private sector firms are focused on providing services or manufacturing goods and identifying potential clients. The key is connecting clients to the firm's offerings by distributing and communicating, which is where marketing is key. For public sector agencies, there is often a clientele that is being served, and ensuring that clientele is aware of the services available may require marketing. Marketing for public agencies can focus on products/services, social marketing to attempt to change behaviors, policy marketing to inform and educate, and demarketing when services are no longer offered (Madill 1998). "Marketing concepts are now being applied to help

encourage program adoption, improve services and change attitudes and behaviors in support of 'public good' mandates" (Hintz, Church, and Colterman 2006, p. 43).

Differences between public and private marketing revolve around the organizations or their environments (e.g. profit versus non-profit, target markets) (Lamb 1987). The organizational differences, also referred to as the environment, are autonomy and flexibility, market exposure, and political influences (Lamb 1987). Generally, public sector agencies have less flexibility than their private counterparts and thus unable to implement marketing strategies as quickly. In terms of market exposure, different funding sources affect the level of exposure as public agencies rely on tax dollars for some or all of their funding. Finally, politics have a greater effect on public agencies. Elections, oversight, lobbying, and other political interests can alter the trajectory of a public agency and its marketing efforts, particularly if budgeting is impacted. The profit versus non-profit dichotomy is an easily observable difference. However, within that dichotomy Lamb (1987) noted three considerations. Objectives are often different, as the private sector is focused on financial gain while the public sector may be pursuing multiple goals, such as efficient use of public funds and constituent services. The public sector also relies on tax dollars for some or all revenue, while the private sector is bound by market prices and customers purchasing products or services. Performance evaluation of the organizational mission, much less its marketing strategy, is also driven by profit for the private sector, whereas the public sector may have multiple evaluation methods depending on the function of the agency in question. Finally, target markets may differ, which is an important consideration for marketing strategies. Private sector firms are focused on consumers most receptive to their product or service offering, while public sector agencies must reach a wider segment of the population, including some which may be apathetic to the message. Marketing strategies may need to focus on reaching particular individuals who may not be otherwise interested or even aware of a public service or change.

Four conditions unique to public sector marketing are: 1) limited control over policy goals and target customers; 2) ability to compel citizens to be customers; 3) services are generally to benefit all (not just target groups); 4) and if payment is received for services it is usually not commensurate with the level of service received (Snaveley 1991). Public agencies may also play a complementary role to one another rather than as a competitor in the private sector. Marketing can take on political overtones when public support is needed to ensure financial support for the

endeavor in question and there is record of prior constituent satisfaction (Jones and Thompson 1997). Branding may also be an important component of marketing, as images of a public agency or process can shape constituent perceptions and responses (Temporal 2015). Branding can help differentiate products or offerings, and help agencies evolve to meet new demands or changes. It can be built using emotional connections through a vision, defined values, and market position. Communication and engagement are two elements of branding that are applicable in this case and many others. Communicating the value of the brand and its offerings, as well as engaging the target audience, are keys to ensuring brand success.

The first issue that often faces public agencies is whether they should be marketing at all (Madill 1998) and in some instances, whether they should compete with the private sector. Marketing for the public sector "makes sense if it contributes to the government's organizational objectives and individual objectives citizens have set" (Buurma 2001, p. 1288). Public agencies can also utilize intermediaries to conduct the marketing or assist in marketing efforts. Marketing may also be negatively equated with advertising (Hintz, Church, and Colterman 2006). Beyond that, difficulties can arise for public-sector marketing when trying to identify the target market (Foxall 1989). For some public agencies, there is not a typical consumer exchange; rather, some information is being disseminated. In other cases, service is provided to an individual but payment is received from another (Kohli and Jaworski 1990). The target audience can be conceptualized based on how much direct or indirect contact takes place between the agency and the public, and how much the individual receiving the service is paying (Hart 1990). Differences in the good or service being offered can also differ greatly. Objections to public marketing are that the citizen is more than a customer, the government is more than merely a supplier of services, and public employees are not oriented toward commercialization (Buurma 2001). Employees in the public sector may lack the required training or background (Madill 1998).

Marketing approaches in the public sector vary based on experience levels, knowledge of marketing approaches, and budgets allocated for marketing activities (Madill 1998). Strategies should consider the "4 P's" of promotion, product, pricing, and place, with public agencies more focused on the promotion. Internal and external audits of marketing policy, can help identify areas for improvement where marketing is impactful as well as potential opportunities or threats to current marketing approaches (Ashworth 1990). Marketing approaches may also be driven by

segmentation – that is, is there a specific market segment being targeted, such as a geographic area, or is the entire market being blanketed with some allowance for potential segmentation within a larger effort? Additionally, product or service considerations, as well as the medium of exchange, are factors that may dictate the scope and nature of marketing efforts.

Engaging in marketing exchange can be thought of as a process (Buurma 2001). First, the government makes it known that a policy, procedure, or benefit is available. Then those affected receive a permit, service, information, or other measure of reciprocation. Finally, both parties have achieved objectives, the public agency having delivered the information to the constituent and the constituent receiving or complying with the issue at hand. Ashworth (1990) described the phases of "city marketing" as analysis, forming goals and developing strategies, determining the geographic scope of the effort, and evaluating the results.

In the case of the IRP process, any new policies and practices would be communicated to trucking companies who would benefit from streamlined processes. Marketing programs that are successful have a defined objective in place and performance measures to gauge the effectiveness of the program (Madill 1998). Hintz, Church, and Colterman (2006) identified eight factors through a survey that can be used to assess marketing in the public sector. Those eight factors are listed below[10] and center on an agency's willingness and commitment to marketing by ensuring buy-in from management, planning, sufficient resources, a marketing knowledge base, and measurement of marketing outcomes.

- Culture
- Organization
- Planning
- Management
- Knowledge and Skills
- Marketing Information and Measurement
- Resources

[10] For more on each factor see p. 47-49.

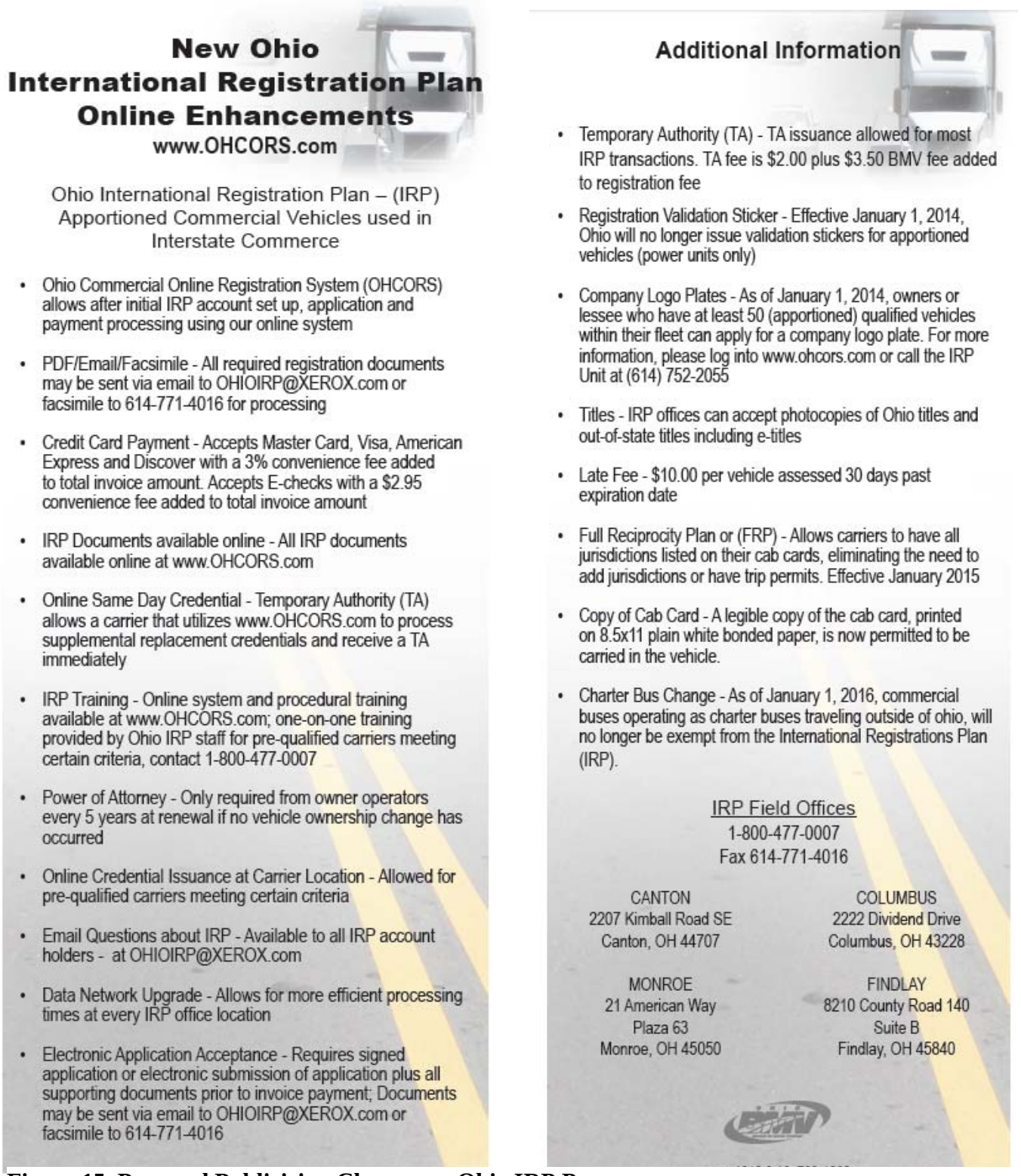
- Results and Outputs

In many cases survey respondents observed a lack of culture and support prevented the effective use of marketing, or even differentiating marketing from basic communications. Coffman (1986) pointed to five factors or "rights" that can both define and measure success in public sector marketing:

- Service
- Markets
- Price
- Means
- Time

Researching and planning are interconnected aspects of marketing, first in knowing the target audience and then preparing the best way to reach that audience. Of course, the challenge is often implementing these factors in an overall marketing strategy that captures these parts and ensures alignment with agency goals. Customer service can be a large part of a marketing effort, as marketing itself is unlikely to succeed without providing service to those who respond to the marketing (Coffman 1986). Service may also help define the orientation of marketing, as the agency becomes customer-centered by being responsive to customer needs. Once the marketing process begins, evaluation is a logical next step. Questions can be asked regarding whether the objectives have been met and how cost-effective the efforts have been.

Ohio has made changes to its IRP registration process to facilitate online transactions for users. Presumably, these changes lessen the compliance burdens for truckers. The changes made were publicized via a postcard (see Figure 15). The postcard listed the various changes, additional information regarding related issues and contact information. This is representative of a targeted effort to increase awareness of changes that were made, and could serve as an example for future changes. Such marketing efforts may be augmented by other approaches to reach trucking companies that have moved registrations to other states, thereby encouraging them to repatriate their registrations to Ohio as a result of efforts the state has made to facilitate the ease of IRP registration and compliance.



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- Ohio Commercial Online Registration System (OHCORS) allows after initial IRP account set up, application and payment processing using our online system
- PDF/Email/Facsimile - All required registration documents may be sent via email to OHIOIRP@XEROX.com or facsimile to 614-771-4016 for processing
- Credit Card Payment - Accepts Master Card, Visa, American Express and Discover with a 3% convenience fee added to total invoice amount. Accepts E-checks with a $2.95 convenience fee added to total invoice amount
- IRP Documents available online - All IRP documents available online at www.OHCORS.com
- Online Same Day Credential - Temporary Authority (TA) allows a carrier that utilizes www.OHCORS.com to process supplemental replacement credentials and receive a TA immediately
- IRP Training - Online system and procedural training available at www.OHCORS.com; one-on-one training provided by Ohio IRP staff for pre-qualified carriers meeting certain criteria, contact 1-800-477-0007
- Power of Attorney - Only required from owner operators every 5 years at renewal if no vehicle ownership change has occurred
- Online Credential Issuance at Carrier Location - Allowed for pre-qualified carriers meeting certain criteria
- Email Questions about IRP - Available to all IRP account holders - at OHIOIRP@XEROX.com
- Data Network Upgrade - Allows for more efficient processing times at every IRP office location
- Electronic Application Acceptance - Requires signed application or electronic submission of application plus all supporting documents prior to invoice payment; Documents may be sent via email to OHIOIRP@XEROX.com or facsimile to 614-771-4016

Additional Information

- Temporary Authority (TA) - TA issuance allowed for most IRP transactions. TA fee is $2.00 plus $3.50 BMV fee added to registration fee
- Registration Validation Sticker - Effective January 1, 2014, Ohio will no longer issue validation stickers for apportioned vehicles (power units only)
- Company Logo Plates - As of January 1, 2014, owners or lessee who have at least 50 (apportioned) qualified vehicles within their fleet can apply for a company logo plate. For more information, please log into www.ohcors.com or call the IRP Unit at (614) 752-2055
- Titles - IRP offices can accept photocopies of Ohio titles and out-of-state titles including e-titles
- Late Fee - $10.00 per vehicle assessed 30 days past expiration date
- Full Reciprocity Plan or (FRP) - Allows carriers to have all jurisdictions listed on their cab cards, eliminating the need to add jurisdictions or have trip permits. Effective January 2015
- Copy of Cab Card - A legible copy of the cab card, printed on 8.5x11 plain white bonded paper, is now permitted to be carried in the vehicle.
- Charter Bus Change - As of January 1, 2016, commercial buses operating as charter buses traveling outside of ohio, will no longer be exempt from the International Registrations Plan (IRP).

IRP Field Offices
1-800-477-0007
Fax 614-771-4016

CANTON
2207 Kimball Road SE
Canton, OH 44707

COLUMBUS
2222 Dividend Drive
Columbus, OH 43228

MONROE
21 American Way
Plaza 63
Monroe, OH 45050

FINDLAY
8210 County Road 140
Suite B
Findlay, OH 45840

Figure 15. Postcard Publicizing Changes to Ohio IRP Process

Chapter 4: Streamlining IRP Registration in Other States

To understand how other states conduct IRP registrations and renewals, the research team canvassed a number of state websites to ascertain if these processes were conducted online. Offering these services online facilitates registration and compliance while using technology to streamline government services. The various states with readily accessible information are listed in Table 10. The availability of online IRP registrations and/or renewals are noted as are other online services or requirements to utilize these services. A more detailed discussion of Indiana's process is included later in this section.

Table 10. IRP Online Status by State

State	IRP Registration Online?	IRP Renewal Online?	Other Online Services
Alabama	No	Yes	Renew IRP, E-file
Minnesota	No	Yes	Renew IRP Change account information View registrations Status Apply for replacement plates and stickers Print cab cards and fuel licenses Add or delete vehicle to fleet Change vehicle weights Add States Create and view Invoices Print temporary operating authority
Washington	Yes	Yes	Register through a Tax Payer Access Point
Tennessee	Yes	Yes	Must establish an e-filing account online – then can process IRP applications and IFTA tax returns
Michigan	No	No	
West Virginia	No	No	
Kentucky	No	Yes	
Pennsylvania	No	No	
Michigan	No	Yes	This service allows carriers to log into their IRP accounts online to process their renewals, add and delete vehicles, transfer plates, request duplicate cab cards, and change weight on vehicles. Payment online is also available.

Illinois	No	Yes	This system is designed for IRP applicants who have a low number of vehicles and who are not making any significant changes.
Wisconsin	No	Yes	
Mississippi	Yes	Yes	
Florida	No	Yes	
Georgia	Yes	Yes	
South Carolina	No	Yes	
North Carolina	No	Yes	
Virginia	Yes	Yes	Webcat service
New York	No	No	Through OSCAR you can add a vehicle to IRP fleet
New Hampshire	No	No	
Vermont	No	No	Can obtain a 72 hour trip permit online
Delaware	No	Yes	
Rhode Island	No	No	Temporary permit only online
Maine	No	No	Some email services--but not fully online
Connecticut	No	No	Pay online
Maryland	No	No	Online Services include: Change of address Supplemental Applications, Add vehicle, Transfer Weight increase
Tennessee	No	No	
Louisiana	No	No	
Texas	No	Yes	

Streamlining IRP Process in Ohio

Until the diffusion of the internet, technology use in government was seen as a means to enhance the managerial effectiveness of public administrators while increasing government productivity (Yildiz 2007). As internet usage expanded and information and communication technologies (ICTs) grew in the 1990s, the role of technology in government began to change. By the early 2000s, advances in ICTs demonstrated that governmental services could be delivered directly to customers (e.g., citizens, businesses, other government entities) 24/7 (Yikdiz 2007).

Today, citizen expectations for electronic services have grown quickly. Private sector retailers (such as Amazon) offer massive selection choices, speedy delivery, and user-friendly web portals. Users accustomed to the sleek interfaces and speed of private sector web services expect the public sector and those government entities will provide comparable services (Medici 2015).

In the March 19, 2015, guidance to federal agencies Office of Management and Budget's Deputy Director for Management stated:

"Citizens and businesses expect government services to be well-designed, efficient, and generally comparable to the services they receive from leading private-sector organizations" (Medici 2015).

However, many governmental organizations, specifically state and local governments, lack the funding and time resources to continually rethink and redesign their public web interface for citizens and/or their target audience. Fortunately, for the provision of many government services, frequent changes are not as necessary for the public sector as they are for the private sector. To sustain the quality of their service provision, government entities must identify a method to efficiently and securely exchange governmental documents and data while providing easy access to citizens, businesses and other public entities (Kaliontzoglou et al. 2005).

Websites intended to provide governmental services to the public must be user friendly. This is especially true for credentialing services that ensure customers remain in compliance with state and national laws. For example, over the last 15 years, states have begun to adopt e-credentialing services, which is faster and more accurate than previous paper-based or legacy system processes (FHWA 2004). There is significant variation among states with respect to their e-credentialing services, specifically in terms of the IRP registration and renewal process. We review several states that offer online IRP registration and/or renewal.

4.1 Indiana

IRP services for Indiana are housed within the Indiana Department of Revenue, under the Division of Motor Carrier Services (MCS) (http://www.in.gov/dor/4106.htm). On the home page for MCS, there is a "New User—StartPoint" link (Figure 16).

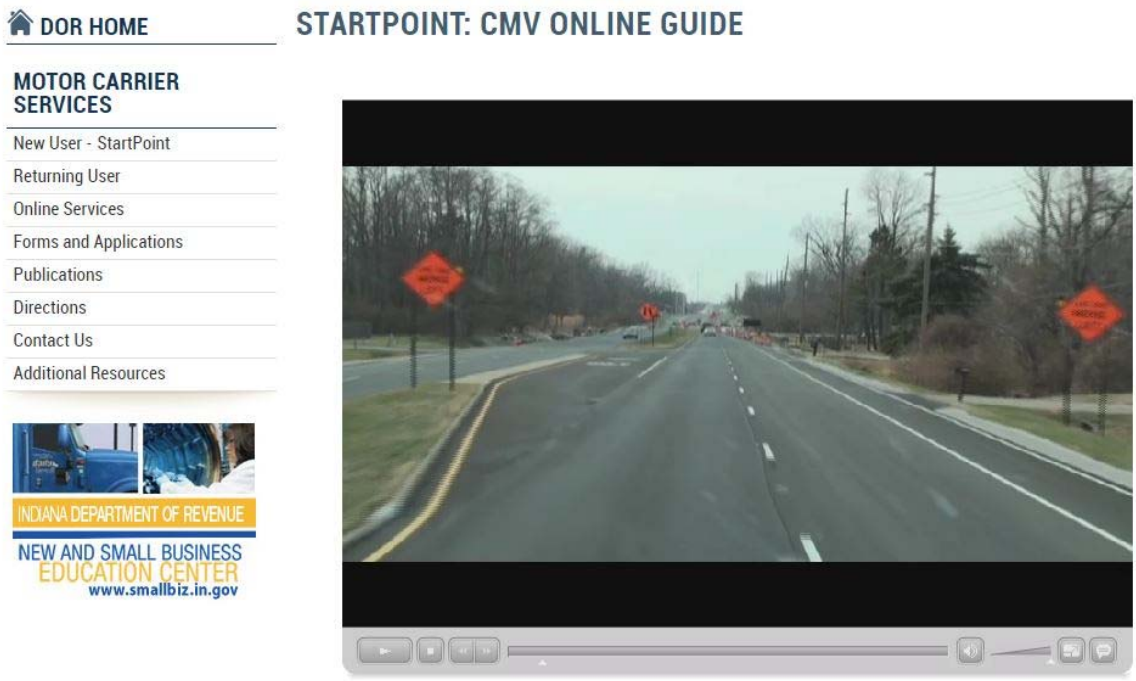

Figure 16. Screenshot of Indiana's CMV Online Guide

This link provides a video and accompanying text that provides commercial vehicle drivers with "everything they need to know" to begin operating a commercial vehicle in Indiana. One section of Start Point is dedicated to IRP. It briefly overviews the program, discusses who needs to know about it, and what to do next.

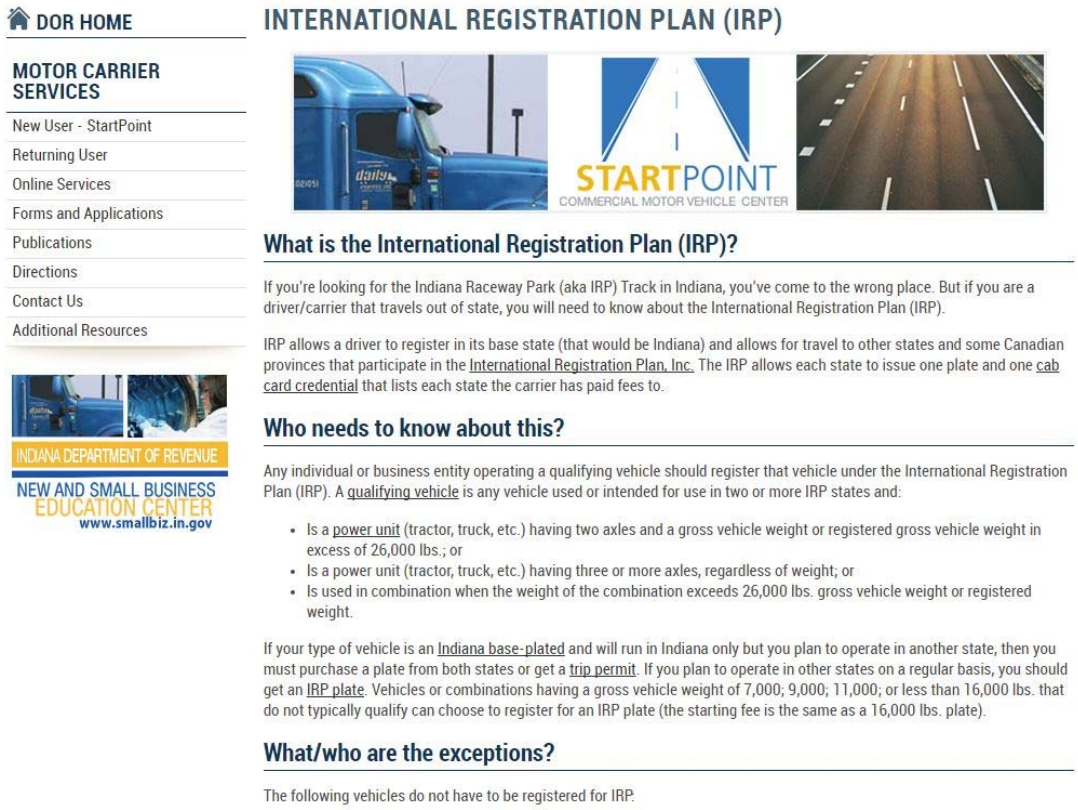

Figure 17. Screenshot of Indiana's IRP Website

If a driver determines that they will need to complete the IRP registration, the MCS website easily allows owners and/or operators complete both IRP and Indiana Base Plate Registration (BRP) applications online. Applicants can process, pay, and print their cab cards directly from the site. Other online transactions include plate renewal, adding other vehicles, transfers, replacement plates and added states. When users select the "More Information" tab, they are provided with a link to register a new account or log-in to an already-established account. In addition to managing IRP accounts online, there is also a section with information links geared directly toward IRP registrations in Indiana, including: an Indiana information handbook, a new accounts checklist, a frequently asked questions page, important IRP notices, forms and applications, renewals, transactions, and information about the Full Reciprocity Plan (see Figure 18).

Figure 18. Screen-Shot of IRP/BPR Application –More Information—link

4.2 Internet Applications and Vehicle Regulation in U.S. States

Martin and Walton (2012) found significant variation between states in terms of the unique information services and interactive web services on vehicle regulation agency websites. The study shows that states with larger populations, more registered drivers and vehicles tend to have more online services. The study looks at several dynamics of website design and functionality, including World Web Wide Consortium Standards, marketing graders, validated online links to verify the level of precision and maintenance, and accessibility options for the disabled. Ohio should undertake a similar study of its web services to determine whether any improvements can be made to IRP web services, information services or related services for motor carriers.

Chapter 5: Implementation Plan

Chapter 1 reviewed the findings from Phase I of this study. In Chapter 2, we reviewed six strategies for mitigating the impacts of jurisdiction shopping on IRP revenue distribution. Chapter 3 examined how marketing strategies may benefit Ohio local officials who want to maximize potential IRP revenues. Information in Chapter 4 provided Ohio officials a look at how other states handle IRP registration, highlighting Indiana's system. This Chapter takes these disparate project elements and develops an implementation plan for Ohio local and state officials to review, amend, and either adopt or reject. The implementation of project recommendations ultimately depends on the institutional support of various stakeholder agencies, groups, and individuals. However, this plan can help interested parties assess the strengths and weaknesses of the reviewed approaches and anticipate future challenges.

The most significantly meaningful aspect of implementation will be changing the IRP distribution mechanism. There are several strategies, components and details to consider, but here we summarize the challenges and advantages of each approach based on several implementation factors we previously identified. Table 11 shows each implementation factor (challenge or advantage) for each strategy reviewed. The strategy numbers correspond to the section of the study each strategy was discussed in. Therefore, "S1" is voluntary repatriation; "S2" is the voucher system; "S3.1" is registration-based redistribution; "S3.2" is CBP-based redistribution; "S3.3" is a hybrid current and registration-based redistribution; "S4" is increasing motor vehicle permissive taxes; "S5" is an increase in IRP fees; and "S6" is a dedicated revenue stream. There are 13 implementation challenges and 7 implementation advantages identified for purposes of this study. There may be other potential challenges or advantages not identified, but this chart includes all of the factors discussed in this report.

One of the challenges facing the redistribution-based strategies is that they are reactive, based on economic trends that only become noticeable after certain economic factors have been set into motion and observable in data the state does not entirely control. This creates two problems. First, the data is based on CVISN- or IRP-sourced registration data, or in the case of the CBP-based distribution, U.S. Census Bureau data. The voluntary nature of the repatriation, voucher system, and local permissive tax make forecasting impacts difficult because key data points are missing such that making accurate projections is impossible. Increasing IRP registration

fees will likely be resisted by the trucking industry, which is a challenge those lobbying for increased fees would have to overcome. Most of these strategies will make the already complex Ohio IRP distribution process even more labyrinthine. S4 would require an increase in the motor vehicle permissive tax, which would require the assent of county commissioners and likely, local voters.

Table 11. Implementation Factors for IRP Truck Licensing Strategies

Implementation Factor	**Strategies**							
Challenges	S1	S2	S3.1	S3.2	S3.3	S4	S5	S6
Delayed response to economic trends			X	X	X			
Difficult to forecast county impact	X	X				X		
Impacts state programs/initiatives								X
Increases ODPS tax complexity		X	X	X	X			X
Increases IRP registration fees							X	
Increases motor vehicle permissive tax						X		
Lack of state control over data inputs	X		X	X	X			
Net losses to large number of counties	X		X	X	X			
Piecemeal solution	X	X			X	X		
Requires change to local law(s)						X		
Requires change to state law(s)		X	X	X	X		X	X
Shifts taxpayer burden						X	X	X
Unclear how to define domiciled vehicle		X						
Total Challenges	**4**	**5**	**5**	**5**	**6**	**5**	**4**	**4**
Advantages								
Comprehensive solution			X	X			X	X
Directly addresses OOS registrations		X	X				X	
Fully funded							X	X
Grants, loans, and tax credits	X							
Locally decide issue	X					X		
Redistribution of current revenue		X	X	X	X			X
Voluntary participation	X	X						
Total Advantages	**3**	**3**	**3**	**2**	**1**	**1**	**3**	**3**

Most of the redistribution strategies result in net losses to a large number of counties because problems with out-of-state registrations are concentrated in a small number of (mostly urban) areas where there are higher motor vehicle permissive taxes. Several of the solutions are piecemeal rather than comprehensive because they address estimated county effects indirectly or only partially. One could contend the redistributions should be piecemeal solutions since the IRP annual excess fund is smaller than the calculation revenue effects, but 88.3 percent of the impact is fairly close to comprehensive. The local permissive taxes strategy would require changes to local law(s), whereas every other strategy (save voluntary repatriation) would require a change to state law. Local permissive tax increases, increased IRP fees, and a direct appropriation from a dedicated funding source would effectively shift the tax burden to a different class of motorists than those who are jurisdiction shopping.

As for challenges, the redistribution strategies, IRP fee increase, and direct appropriation all have the virtue of being comprehensive solutions to the problem, although they address it somewhat differently. Several of the strategies directly address the out-of-state registration issues, whereas a few address it indirectly. The redistribution based on out-of-state registrations along with the voucher system do so most directly. One key difference is that the voucher system is not a comprehensive solution unless one expects all 88 counties to adopt it, which is unlikely. The fee increase and direct appropriation address it by appropriating non-federal funds from the state. Only the IRP fee increase and direct appropriation are fully funded or completely ameliorate the estimated effects. The IRP annual excess fund is not as large as the estimated county impacts, and the other strategies are piecemeal solutions.

A key challenge for the voucher system will be defining what constitutes a domiciled vehicle. In most states, and according to federal regulations, this corresponds to the state of registration. Given the laxity of jurisdictional activity or domiciled requirements for IRP registrations, it is difficult to know whether the state or province in which a truck is plated is representative of where a truck operates or rests when it is not in operation. Ohio could establish a standard based on the amount of time a truck spends in the state or the average number of vehicles domiciled at a terminal on a given day, but measuring such activity accurately could engender far more costs than benefits.

One advantage of the voluntary repatriation and voucher strategies is that they are voluntary (i.e., not compulsory). This tends to reduce opposition and create less friction, even if the resulting solution is less effective. The voluntary repatriation strategy would be more effective if paired with some grants, loans or tax credits offered by the ODSA. This is the only strategy where these incentives are utilized. Redistribution of current revenue is advantageous because it does not require additional revenue to be raised, which given the generally pervasive anti-taxation sentiment common in most states, should be seen as advantageous. However, that does mean revenue will shift between agencies, which could cause some friction.

Each strategy has between four and six implementation challenges. Voluntary repatriation, IRP fee increase, and direct appropriation have fewer implementation challenges than redistribution strategies. The motor vehicle permissive tax and hybrid approach have the fewest clear advantages, whereas voluntary repatriation, the voucher system, IRP fee increases, and direct appropriation have three advantages each. Overall, voluntary repatriation, an increase of IRP fees, and direct appropriation are tied for the most advantages (3) and fewest challenges (4). In particular, the increase of IRP fees and direct appropriation are very strong candidates because they fully address the financial impact of jurisdiction shopping. However, the research team recognizes there are other factors that have not been considered and that some factors deserve more weight than others. This chart hopefully clarifies the choices and provides a clear path forward.

References

Ashworth, G.J. 1990. *Selling the city: marketing approaches in public sector urban planning*. Bellhaven Press: London.

Bouzas-Lorenzo, Ramon. 2010. Public sector marketing, political science and the science of public administration: the evolution of a transdisciplinary dialogue. *International Review of Public Nonprofit Marketing*, 7: 113-125.

Bureau of Labor Statistics. 2016. "Truck Transportation: NAICS 484." Accessed at: http://www.bls.gov/iag/tgs/iag484.htm

Buurma, Hans. 2001. Public policy marketing: marketing exchange in the public sector. *European Journal of Marketing*, 35(11/12): 1287-1302.

Casavant, Ken and Eric Jessup. Idaho Commercial Truck Registration Study. National Institute for the Advancement of Transportation Technology, University of Idaho, 2004. www.webs1.uidaho.edu/niatt/research/Final_Reports/KLK480_N04-05.pdf. Accessed February 7, 2012.

Coffman, Larry. 1986. *Public-sector marketing: a guide for practitioners*. New York: Wiley.

County Commissioner's Association of Ohio. 2013. "Ohio County Commissioner's Handbook." Chapter 20: County Permissive Motor Vehicle License Tax. Accessed at: http://www.ccao.org/userfiles/HBKCHAP20%203-8-13.pdf

Cousins, L. 1990. Marketing planning in the public and non-profit sectors, *European Journal of Marketing*, 24(7):15-30.

FHWA. 2004. "CVISN Electronic Credentialing for Commercial Vehicles in Washington State." Available at: http://ntl.bts.gov/lib/jpodocs/repts_te/13980_files/washington.pdf

Foxall, G. 1989. Marketing's Domain. *European Journal of Marketing*, 23(8):7-22.

Graham, Peter. 1994. Marketing in the Public Sector: Inappropriate or Merely Difficult? *Journal of Marketing Management*, 10: 361-375.

Hart, Hein W. C. van der. 1990. Government Organizations and their Customers in The Netherlands: Strategy, Tactics and Operations. *European Journal of Marketing*, 24(7): 31-42.

Hintz, James, Doug Church, and Bernie Colterman. 2006. The Case for Marketing in the Public Sector. Optimum: The Hournal of Public Sector Management, 36(4): 40-58.

Jones, Lawrence, and Fred Thompson. 1998. The Five R's of the New Public Management. In *Advances in International Comparative Management: International Perspectives on the New Public Management*, edited by Lawrence Jones et al., 15-45. Greenwich, CT: JAI Press.

Kaliontzoglou, A., P. Sklavos, T. Karantjias, and D. Polemi. 2005. "A secure e-Government platform architecture for small to medium size public organizations." *Electronic Commerce Research and Applications*, (4): 174-186.

Kohli, A. K. and Jaworski, B. J. 1990. Market Orientation: The Construct, Research Propositions, and Management Implications. *Journal of Marketing*, 54(April):1-18.

Lamb, Charles W. 1987. Public Sector Marketing is Different. *Business Horizons*, July-August: 56-60.

Madill, Judith. 1998. Marketing in government. *The Journal of Public Sector Management*, 28(4): 9-18.

Martin, Andrew and Jennifer Walton. July 2012. "DVR Internet Applications Study." Kentucky Transportation Center. KTC-12-06/SPR 413-10-1F. (SPR)

Medici, A. 2015. "Can the Government Fix Citizen Services?" *Federal* Times, Available at: http://www.federaltimes.com/story/government/management/2015/05/17/can-government-fix-citizen-services/27258113/

Serrat, Olivier. 2010.*Marketing in the public sector.* Washington, DC: Asian Development Bank.

Snaveley, Keith. 1991. Marketing in the Government Sector: A Public Policy Model. *American Review of Public Administration*, 21(4): 311-326.

Temporal, Paul. 2015. *Branding for the public sector: creating, building, and managing brands people will value*. Chichester, West Sussex: Wiley.

Walsh, Kieron. 1994. Marketing and Public Sector Management. *European Journal of Marketing,* 28(3): 63-71.