Fiscal and Economic Analysis for Extending the Title 21 Protocol Sunset Date

Introduction

There are currently more than 870 lane mile of toll roads, high-occupancy/toll lanes, and bridges operating in California. All these facilities, except for one toll road in San Diego County, only collect tolls electronically. The electronic toll collection (ETC) systems used on these facilities are managed by six different local government entities, hereafter referred to as the "toll facility operators". (It should be noted that the ETC operations for the state-owned bridges in the San Francisco Bay Area are handled by one of these toll facility operators and not by Caltrans).

Streets and Highways Code (SHC) section 27565 requires the California Department of Transportation (Caltrans), in cooperation with the toll facility operators, to develop functional specifications and standards, i.e., a protocol for automated vehicle identification (AVI), which would be used for ETC. The protocol governs the features of transponders mounted in vehicles and overhead devices (readers) which detect the transponders.

The current protocols used for ETC in California are "Title 21" after the section of the California Code of Regulations where the specifications for the standard are listed and International Standards Organization (ISO) 18000-63 commonly referred to as "6C".

Currently, the Title 21 protocol is scheduled to be phased out by December 31, 2023. The state's toll facility operators have requested that Caltrans modify the existing regulation to extend the date the Title 21 protocol can be used to December 31, 2026.

Transponder Costs and Distribution

The local government agencies that operate ETC systems distribute the transponders used for ETC. There are currently approximately 12 million active Title 21 and 6C protocol transponders in California split evenly between protocols. Some toll facilities permit toll-free travel for vehicles with a minimum number of occupants. In order to travel toll-free, these vehicles must be equipped with a special transponder that has a switch on it that can be set to indicate the number of people in a vehicle; these are referred to as a "switchable transponder".

Table 1 shows the current number of transponders in circulation among the different toll facility operators. Some of them have only distributed Title 21 transponders while others have only distributed 6C transponders. The toll facility operators have not issued as many transponders as anticipated in recent years due to COVID-19 travel restrictions and its impacts on travel patterns. Therefore, it has taken longer to issue the remaining inventories of Title 21 transponders and some of the toll facility operators are still finishing issuing a limited number of these transponders.

Table 1. Status of Transponder Distribution

Toll Facility Operator	Number of Title 21 transponders in distribution	Number of 6C transponders in distribution
Bay Area Toll Authority	3,300,000	1,400,000
Los Angeles County Metropolitan Transportation Authority	770,000	0
Orange County Transportation Authority	150,000	470,000
Riverside County Transportation Commission	0	30,000
Transportation Corridor Agencies	1,700,000	4,200,000
San Diego Association of Governments	160,000	6,000

Data Source: http://fastrak.org/FASTRAK (retrieved July 2022); San Diego Association of Governments (retrieved February 2023)

The toll facility operators bear the full costs of procuring and distributing the transponders to the public. A member of the public is not required to pay for the transponder. The toll facility operators also bear the full costs of collecting and disposing existing Title 21 transponders and replacing them with 6C transponders as part of the phase out of the Title 21 protocol. Table 2 shows the average costs to procure and distribute transponders as well as the costs to collect and dispose of the Title 21 transponders.

Table 2. Transponder Procurement, Distribution, and Collection Costs

Transponder Type	Purchase Cost	Shipping Cost	Disposal Cost
Title 21 Non-Switchable	$15.00	$3.00	$0.28
Title 21 Switchable	$20.00	$3.00	$0.28
6C Non-Switchable	$0.50	$1.00	N/A
6C Switchable	$5.00	$3.00	N/A

A Tile 21 transponder has a useful life of about 5 years; this amounts to a cost of about $4 per year for a switchable transponder and $3 per year for a non-switchable transponder. 6C transponders have a perpetual lifespan due to their design. Recently issued Title 21 transponders have considerable useful life left. This proposed extension of the sunset date for Title 21 will allow the toll facility operators to be able to realize the useful life of the existing Title 21 transponders remaining in their inventories and those that are still in circulation. They are expected to save money by not needing to immediately collect and dispose of the existing Title 21 transponders and they will not need to purchase as many 6C transponders to replace those transponders. They can also spread out the costs of collecting and disposing of the Title 21 transponders.

Fiscal Impact Assessment

A current condition ("baseline") scenario was developed to estimate the fiscal impacts of the proposed regulatory change. The following assumptions were made:

- Based on the information received from local government agencies regarding the number of Title 21 transponders issued and the rate of issuance, it is expected that by January 2024 there will be 4.6 million remaining Title 21 transponders still in inventories and in circulation.
- Title 21 transponders would be phased out in calendar year 2024.
- Approximately 78 percent of the Title 21 transponders are non-switchable.
- For the purposes of this exercise there would be no growth in the number of transponders issued overall during the 3-year extension.
- Approximately 1 percent of 6C transponders are replaced every year due to damage or loss.
    - Of these replacement 6C transponders, 51 percent would be switchable.

Table 3 shows the breakdown of transponder distribution under the baseline scenario based on the assumptions above while Table 4 shows the purchase, shipping, and disposal costs associated with the baseline scenario based on the assumptions above and the costs shown in Table 2.

Table 3. Transponder Distribution Under Baseline Scenario

	2023	**2024**	**2025**	**2026**
Title 21 transponders remaining at start of year	6,080,000	4,560,000	0	0
6C transponders in use	6,100,000	7,620,000	12,180,000	12,180,000
Title 21 transponders to be disposed during the year	1,520,000	4,560,000		
6C transponders to be replaced during the year	61,000	76,200	121,800	121,800
6C transponders to be issued in exchange for Title 21 transponders	1,520,000	4,560,000	-	-
Title 21 transponders remaining at end of year	4,560,000	0	0	0

Table 4. Transponder Purchase, Shipping, and Disposal Costs Under Baseline Scenario

	2024	**2025**	**2026**	**Total**
Purchase	$12,958,179	$340,431	$340,431	**$13,639,04**
Shipping	$9,365,124	$246,036	$246,036	**$9,857,196**
Disposal	$1,276,800.00	N/A	N/A	**$1,276,800**
Total	**$23,600,103**	**$586,467**	**$586,467**	**$24,773,037**

If the sunset date is extended it is assumed that the Title 21 transponders would be disposed of equally each year between 2024 and 2026, for an approximate total of 1.5 million transponders being disposed of per year. Table 5 shows the breakdown of transponder distribution under the proposed regulatory change based on this assumption and the other assumptions above. Table 6 shows the purchase, shipping, and disposal costs under the proposed regulatory change based on these assumptions and the costs shown in Table 2.

Table 5. Transponder Distribution Under Proposed Regulatory Change

	2023	2024	2025	2026
Title 21 transponders remaining at start of year	6,080,000	4,560,000	3,040,000	1,520,000
6C transponders in use	6,100,000	7,620,000	9,140,000	10,660,000
Title 21 transponders to be disposed during the year	1,520,000	1,520,000	1,520,000	1,520,000
6C transponders to be replaced during the year	61,000	76,200	91,400	106,600
6C transponders to be issued in exchange for Title 21 transponders	1,520,000	1,520,000	1,520,000	1,520,000
Title 21 transponders remaining at end of year	4,560,000	3,040,000	1,520,000	0

Table 6. Transponder Purchase, Shipping, and Disposal Costs Under Proposed Regulatory Change

	2024	2025	2026	Total
Purchase	$4,461,379	$4,503,863	$4,546,347	$13,511,589
Ship	$3,224,324	$3,255,028	$3,285,732	$9,765,084
Disposal	$425,600	$425,600	$425,600	$1,276,800
Total	**$8,111,303**	**$8,184,491**	**$8,257,679**	**$24,553,473**

Table 7 shows the life cycle cost savings for the extra years of service life that would be obtained from the Title 21 transponders due to the proposed regulatory change. This assumes that 78 percent of the Title 21 transponders are non-switchable, that a switchable transponder costs about $5 per year of useful life and a non-switchable transponder cost of $4 per year of useful life. The savings would be seen in calendar years 2025 and 2026.

Table 7. Life-Cycle Cost Savings for Title 21 Transponders Under Proposed Regulatory Change

	2025	2026	Total
Non-Switchable	$2,006,400	$1,003,200	$3,009,600
Switchable	$9,484,800	$4,742,400	$14,227,200
Total	**$11,491,200**	**$5,745,600**	**$17,236,800**

Table 8 shows the total costs and savings resulting from the regulatory change.

Table 8. Total Costs and Savings Under Proposed Regulatory Change

	2024	**2025**	**2026**	**Total**
Purchase, Shipping and Disposal Costs without Regulatory Change (Baseline)	$23,600,103	$586,467	$586,467	$24,773,037
Purchase, Shipping and Disposal Costs with Regulatory Change	$8,111,303	$8,184,491	$8,257,679	$24,553,473
Difference in Costs with Regulatory Change	**$15,488,800**	**$(7,598,024)**	**$(7,671,212)**	**$219,464**
Difference in Costs + Title 21 Transponder Life Cycle Cost Savings	**$15,488,800**	**$3,893,176**	**$(1,925,612)**	**$17,456,364**

Most of the cost savings from extending the sunset date are the result of getting more useful years out of the Title 21 transponders that were already paid for and in use. The savings from getting more useful years out of the Title 21 transponders are estimated to be $17.2 million. The costs of purchasing, shipping, and disposing of transponders are spread out and result in a savings of about $0.2 million over the 3-year period.

Economic Impact Assessment

The economic impact assessment of this proposed regulatory change was done using IMPLAN, an economic tool. The name stands for "Economic Impact Analysis for Planning". The tool was used to model the impact on the state's economy by calculating certain economic metrics such as output and labor income in specific industries.

The estimated $17.5 million in savings generated by the extension of the sunset date was divided by 3 to come up with the annual savings of $5.8 million for each year of the analysis period. This information was entered into IMPLAN to calculate the total direct, indirect, and induced effects resulted, when the money is infused into the economy.

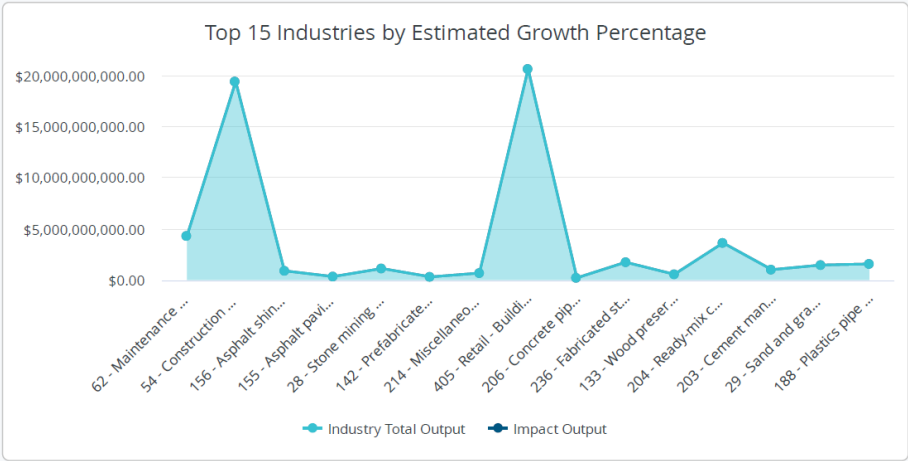
The analysis focused on two sectors, Highway Construction and Highway Maintenance/Rehabilitation, with the split of 40 percent to the former and 60 percent to the latter. As seen in Figure 1, IMPLAN concluded that 49 jobs will be created and total impacts of $11.4 million will be generated. About 22 jobs would be created and roughly $4.5 million in output would occur in the Highway Construction sector of the economy and 27 jobs would be created and $6.9 million in output would occur in the Maintenance and Rehabilitation sector. More details are provided in the Appendix.

Figure 1. Economic Indicators by Impact

Economic Indicators by Impact

Impact	Employment	Labor Income	Value Added	Output
1 - Direct	25.63	$2,177,747.68	$2,910,812.08	$5,818,788.00
2 - Indirect	10.93	$911,753.94	$1,616,364.57	$2,977,728.02
3 - Induced	12.39	$910,666.46	$1,608,744.97	$2,583,391.49
Totals	48.94	$4,000,168.08	$6,135,921.62	$11,379,907.50

Figure 2. Industry Growth by Estimated Percentage



Conclusions

- Consumers using the toll facilities are not impacted by any sunset extension. The toll facility operators do not charge customers to purchase a transponder, nor do they charge for collection and disposal of old transponders. This practice would remain unchanged with this regulatory change.

- The toll facility operators would experience savings of about $17.5 million over the 3-year extension of the sunset date. These savings are primarily obtained by increasing the useful life of Title 21 transponders.

- The savings achieved by extending the sunset date allows toll facility operators to allocate their savings toward other purposes such as maintaining and improving the toll facilities. For this analysis, it was assumed that the toll facility operators would reinvest all savings into the toll facilities by devoting 60 percent to toll facility maintenance and pavement rehabilitation and 40 percent to new facility construction and network expansion. This would result in an additional 49 jobs annually. 22 of those would be in Highway Construction and 27 in the Maintenance and Rehabilitation Sector.

Appendix

Table 9: Detailed Impacts Broken by Sectors

Group Name	Event Name	Region	Impact	Employment	Labor Income	Value Added	Output
Alt 02.13.2023 (2021)	new construction	California (2021)	1 - Direct	13.16	$1,131,304.11	$1,334,224.93	$2,327,515.20
Alt 02.13.2023 (2021)	Maint/Rehab	California (2021)	1 - Direct	12.47	$1,046,443.57	$1,576,587.16	$3,491,272.80
Alt 02.13.2023 (2021)	new construction	California (2021)	2 - Indirect	3.09	$292,337.70	$515,714.33	$982,534.33
Alt 02.13.2023 (2021)	Maint/Rehab	California (2021)	2 - Indirect	7.84	$619,416.24	$1,100,650.24	$1,995,193.69
Alt 02.13.2023 (2021)	new construction	California (2021)	3 - Induced	5.71	$419,649.94	$741,308.36	$1,190,428.46
Alt 02.13.2023 (2021)	Maint/Rehab	California (2021)	3 - Induced	6.68	$491,016.52	$867,436.60	$1,392,963.03
Total Impact:				**49**	**$4,000,168.08**	**$6,135,921.62**	**$11,379,907.50**
New Construction Sector Impact:				**22**	**$1,843,291.75**	**$2,591,247.62**	**$4,500,477.99**
Maint/Rehab Sector Impact				**27**	**$2,156,876.33**	**$3,544,674.00**	**$6,879,429.52**

Table 10: Estimated Industry Growth

	Display Code	Display Description	Industry Total Output	Impact Output	Estimated Growth Percentage
1	62	Maintenance and repair construction of highways, streets, bridges, and tunnels	$4,294,300,601.70	$3,491,284.27	0.08%
2	54	Construction of new highways and streets	$19,374,459,412.56	$2,327,515.20	0.01%
3	156	Asphalt shingle and coating materials manufacturing	$892,107,712.49	$104,884.75	0.01%
4	155	Asphalt paving mixture and block manufacturing	$332,119,356.78	$20,565.67	0.01%
5	28	Stone mining and quarrying	$1,119,168,137.55	$69,179.92	0.01%
6	142	Prefabricated wood building manufacturing	$303,222,226.72	$11,584.54	0.00%
7	214	Miscellaneous nonmetallic mineral products manufacturing	$671,508,809.30	$15,024.05	0.00%
8	405	Retail - Building material and garden equipment and supplies stores	$20,599,847,584.06	$459,167.24	0.00%
9	206	Concrete pipe manufacturing	$206,387,797.11	$4,308.24	0.00%
10	236	Fabricated structural metal manufacturing	$1,733,584,218.80	$35,369.26	0.00%
11	133	Wood preservation	$552,174,490.92	$10,749.18	0.00%
12	204	Ready-mix concrete manufacturing	$3,617,065,617.47	$69,681.46	0.00%
13	203	Cement manufacturing	$1,005,909,570.73	$15,199.53	0.00%
14	29	Sand and gravel mining	$1,454,604,494.12	$20,464.99	0.00%
15	188	Plastics pipe and pipe fitting manufacturing	$1,565,220,027.01	$21,880.61	0.00%
16	207	Other concrete product manufacturing	$1,256,039,546.30	$16,877.35	0.00%
17	218	Steel wire drawing	$243,994,623.55	$3,128.76	0.00%
18	208	Lime manufacturing	$15,121,449.97	$179.21	0.00%
19	240	Ornamental and architectural metal work manufacturing	$882,913,259.24	$10,034.60	0.00%
20	235	Prefabricated metal buildings and components manufacturing	$786,539,606.68	$6,722.35	0.00%
21	175	Paint and coating manufacturing	$2,790,814,982.24	$23,551.22	0.00%
22	205	Concrete block and brick manufacturing	$430,135,473.62	$3,037.73	0.00%
23	212	Ground or treated mineral and earth manufacturing	$99,368,012.11	$661.33	0.00%
24	135	Engineered wood member and truss manufacturing	$1,023,837,539.93	$6,615.20	0.00%
25	198	Brick, tile, and other structural clay product manufacturing	$352,584,558.08	$2,124.19	0.00%