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Synthesis Study: Facilities (Enterprise Development, Sponsorship/Privatization)

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16. Abstract

The Indiana Department of Transportation maintains 17 rest area locations with 28 separate rest area facilities located on interstates for driver safety and convenience. Although the rest areas provide many benefits to the traveling public, the rest areas do not earn direct profits. Moreover, the Indiana Department of Transportation is increasingly challenged by inadequate funding from taxes generated on the interstates. Constrained by Title 23, that prohibits the commercialization and the privatization of the rest areas, the state of Indiana has a high interest in sustainable sources of revenue at the rest areas that would be able to promote the states and facilities tourism and commerce. The benefits that can be recognized by taking up this project are (i) higher revenues for the INDOT (ii) cost savings wherever possible (iii) environmental benefits (iv) better services and safety measures for overnight travelers (v) partnerships with local businesses.

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EXECUTIVE SUMMARY

Introduction

Recently, many states have had to shut down rest areas along the interstates due to insufficient resources. Rest areas provide free service to commuters and state taxes allocated to rest areas are insufficient. Currently, the Indiana Department of Transportation maintains 17 rest area locations with 28 separate rest area facilities located on interstates. Like other states, INDOT is increasingly challenged by inadequate funding from taxes generated on the interstates. This project explores innovative services that would attract commuters and generate revenue, thus making Indiana rest areas self-sufficient. Along with a summary of the surveys carried out by different states that compiles the needs and expectations of rest area users, the project group estimated the cost and revenue for each proposed solution.

Findings

Most Indiana rest areas have basic facilities such as bathrooms and vending machines. Since these facilities are not revenue generating, the group studied surveys carried out by different states regarding facilities that could be provided at rest areas. The surveys focused on customer expectations and needs from the rest areas.

Based on the analysis of these surveys, we developed a few innovative ideas to improve the public services that could be added to the rest areas. The composition of individual rest areas may vary, but permitting shorter term leases, software based displays, and variable pricing based on user needs may be the key to service and revenue sustainability. While revenues are a concern, showcasing local tourism and partnering with Indiana Originals may enable INDOT to generate goodwill and added enthusiasm to upgrading the rest areas. We have been careful to prevent competition with existing businesses so that recommendations comply with existing federal regulations regarding rest area businesses, while also keeping in mind INDOT's stated vision for developing Indiana's future transportation system. Rest Area 2.0 has the opportunity to showcase state assets and communicate that INDOT and Indiana embrace the future, thus encouraging customers to spend more time at rest areas and use the different facilities. Several benefits from adopting the proposed improvements include environmental sustainability, economic sustainability, cleanliness and safety, better facilities and services, and the encouragement of local businesses. The solutions would also generate revenue, thereby helping INDOT maintain the rest areas without spending more tax money.

In order to ensure if these solutions are economically feasible, we determined the cost of implementing these ideas, projected the revenue that would be generated to offset the initial expenses, and estimated the payback period before these changes would become profitable. To project the revenues that would be generated, certain information-based assumptions were made.

Implementation

This project can be used to benchmark rest areas and their facilities in the state of Indiana against the rest areas in other states and countries, thereby improving the facilities provided to Indiana commuters. The study suggests innovative solutions that can be used to generate revenue for INDOT and make the rest areas self-sustainable across the state.

CONTENTS

INTRODUCTION

The Indiana Department of Transportation maintains 17 rest area locations comprised of 28 separate rest area facilities on interstates for driver safety and convenience. Although these rest areas provide many benefits to the traveling public, they do not earn direct profits. Moreover, INDOT is increasingly challenged by inadequate funding from taxes generated by the interstates. Constrained by Title 23, which prohibits the commercialization and the privatization of rest areas, the state of Indiana has a strong interest in sustainable sources of revenue from these rest areas that would be able to promote the state's and facilities' tourism and commerce. The benefits that can be recognized by taking up this project are (1) higher revenues for the INDOT, (2) cost savings wherever possible, (3) environmental benefits, (4) better services and safety measures for overnight travelers, and (5) partnerships with local businesses.

This report features various opportunities to generate revenue, as well as benchmarking with other state DOT projects. It also provides a ballpark estimate of the capital expenditure required to undertake the various projects, along with associated revenue and the open space required for implementation. In addition, it outlines the opportunities and the threats of the proposed solutions. While many value extraction projects may seem financially feasible, each must be evaluated and adhere to the Indiana legal guidelines pertaining to this project.

The following steps have been taken to meet the above objectives.

- Comparative analysis of the rest area renovation plans developed by other states and countries. The needs and the expectations of the rest area users have been evaluated.
- Evaluation of the impact of the long-range transportation plan on the objectives of the Rest Area 2.0 project. This evaluation was performed to ensure that the solutions provided by Rest Area 2.0 are in line with the stated vision for developing Indiana's future transportation system.
- Research on innovative and sustainable solutions for the Rest Area 2.0 project that increase the services provided without impacting INDOT's costs.
- Analysis of opportunities and constraints to the development of solutions.
- Creation of a ranked list of innovative solutions that would provide sustainable sources of revenue for the improvement of the rest areas.

The needs and the expectations of the rest area users have been collected and evaluated by the following states, regions, and countries: Iowa, Oregon, Montana, New England, and Austria. According to the data collected, rest area visitors have concerns about the cleanliness of the washrooms and safety of the rest area. The participants also complained about the unavailability of parking lots and insufficient lighting at the rest stops. Most of the commuters responded favorably when asked about the potential introduction of new amenities at rest stops. These amenities included weather/traffic information, tourist information, availability of healthier and higher quality food and drink options, convenience stores with accessibility to first aid, and reservations for hotels and restaurants. The improvements that users favored could increase the frequency of their usage of highway rest areas and the length of their stoppage, which currently ranges from 5 to 10 minutes.

While addressing the concerns of visitors may require additional capital investments, the revenue-generating solutions proposed can offset the costs. Since the analyzed surveys included only a few improvements and amenities that could earn profits, a survey that evaluates the proposed solutions may be required.

RANKING 1—ELECTRIC VEHICLE CHARGING STATION

As the prices of electric vehicles continue to go down and their popularity among drivers continues to go up, rest areas and other road stops need to adapt to be able to accommodate needs for all drivers. The implementation of electric vehicle charging stations at INDOT rest areas would offer services to a wider range of drivers while also giving the areas more of a modern look and feel. Today, the average cost nationally for the installation of a single Level 2 240V electric charging station ranges between $435 and $974, with the average cost in Indiana currently at $546 per station. Technology on electric cars is still somewhat limited, and on average it can take about 4 hours to fully charge a vehicle when using a 240V charging station. Due to the long waiting time for these chargers, it is suggested that at least 3 stations be installed at each rest area at which they are being implemented. This would bring the average cost of electric vehicle charging installation to approximately $1,638 per rest area. In terms of revenue generated, the current average rate being charged to customers who wish to charge their electric vehicles is around $3.90 per 100 miles. This is based off of a standard EV battery requiring 30 kWh per 100 miles and the average national residential utility rate of $0.13 per kWh. An average maximum distance of 100 miles per full charge for an electric vehicle battery was also used in calculations. Using these rates, it would take approximately 420 vehicles requiring a full charge to make up for the initial costs of installation. In addition to the costs of installation, it is estimated that the maintenance for a single charging station is around $300 per year according to University of California Los Angeles. These costs could be covered by only 77 vehicles requiring a full charge per year. There are alternative charging options which are able to shorten charging times, but they do come at a slightly increased risk of vehicle battery damage and at a drastically higher cost. For example, the EVRUS ultra-fast 150 kW charging station has the ability to

charge a standard electric vehicle such as a Nissan Leaf up to 80% of its charging capacity in 30 to 60 minutes, however costs of installation for one of these Level 3 chargers can cost upwards of $40,000 total between equipment and labor costs. The per mile costs of using the Level 3 charger once it is installed are about the same as a Level 2 charger. Fortunately, the prices of these Level 3 chargers are expected to fall in the coming years. Overall, this project has high potential for long-term profitability, especially as the number of people driving electric vehicles continues to increase (Chang et al., 2012; Home Advisor, 2019a; Ohm Home, n.d., Saxton, 2011; Vivint Solar, 2018).

RANKING 2—HIGH-SPEED INTERNET SERVICE

High-speed internet has become almost a necessity today. Mobile cellular data is expensive which can make wireless internet access desirable, but consumers also need to be able to trust the network they are connecting to. The price of installing high-speed internet in a rest area will vary from company to company and location to location, however the average price range for high-speed internet is $50 to $500 per month depending on the level of service purchased. Charging for high-speed internet access can be an effective source of revenue for the rest areas, but usage may be unreliable because some people will choose to use their own mobile data instead of paying for a wireless internet service. In order for wireless internet provision to be appropriate in rest areas, it would need to be reliable, and available at a reasonable cost to the consumer. High-speed, wireless internet could be offered in small, quiet spaces within rest areas to appeal to business customers or consumers that want to watch or download media content. Offices across India, Japan, the U.S., and the UK have begun to implement "phone booth" type office spaces which are able to offer a quiet, reasonably sized area to utilize high-speed internet and other technologies. The rental of these spaces, or just of the high-speed internet itself, could be offered to rest area users at an hourly rate in order to generate revenue. Even a rate of $5 per hour charged to the consumer would only need to generate 10 and 20 total hours of usage per month in order to make up for the costs of the service. Another alternative to permit paying by hour, which be through an app which travelers can download which allows them access the internet, download videos and movies, download books, get traveling information and more. The app could either require a one-time payment for download or be free, but either way could be paid for by using advertising space within the app. Whether by hourly rate, or by continued users through the app, this technology has the ability to vastly increase the modern appeal of rest areas to their users (Cisco, n.d.; Descant, 2018; Gross, 2019).

RANKING 3—INTERACTIVE TOUCH SCREEN DISPLAY

Using an interactive touch screen display at rest areas is a reasonably priced technology which has the potential to change the look and feel of the entire rest area. Through the use of this technology rest areas could display available parking, updates on services provided by different rest stops, traffic updates, and a base for all other services/goods offered by INDOT at rest areas. The price for this technology can range anywhere from about $1,000 to $6,000 depending on the brand, screen size, screen resolution, and capabilities of the hardware. In addition to the cost of the screen itself, additional costs to install and upkeep the interactive display are as follows: $400 to $1,000 for software depending on the complexity, $200 to $400 to upgrade CPU and integrate with back-end systems such as a website, $1,000 approximately for installation, $100 to $500 for the mount for the screen (price depends on where and how it is mounted), and $70 for a credit/debit card reader. Overall, the use of a digital, interactive touch screen display would require an initial investment of somewhere between $2,700 and $10,000, however additional screens installed at rest areas after the first one could use the same software that has already been created and would cut that cost down to between $2,300 and $8,000 per screen. It should also be noted that ordering in bulk for both the hardware and software involved in the installation of these screens could bring prices down significantly. This technology has the ability to earn its money back at entirely different rates depending on how it is used. Some ideas for revenue sources through the screen have been offering downloadable content such as movies and games, educational activities for children, and offering space on the screen's display for advertisements. These things and more could all be paid for by using the card reader attached to the display. If every rest area visitor spent an average of even $0.25 per stop by using the new display, costs could be earned back in a matter of months, if not sooner, depending on the number of visitors and amount spent per visit. For instance, an article from the Dubois County Herald states that INDOT claims that around 1,300 vehicles per day visit the two rest areas in Dubois County, IN. If each of these vehicles spent an average of even just $0.10 on their visit, this would already generate $130 in revenue in one day. The potential for this technology, if used properly, to earn back the initial investment plus an additional profit is high (Amazon, 2019; Popcomms, 2017; Price It Here, 2019; Touchboards, 2019; Vasta, 2019).

RANKING 4—INDIANA ORIGINALS

Indiana Originals is a community of business owners who work together in order to create a healthier, stronger community. One of their main goals is the creation of jobs within Indiana by encouraging

Indiana-based businesses to work hand in hand instead of in opposition. Every single business featured by Indiana Originals has been vetted and approved for membership which means that they are certifiably Indiana owned and operated, headquartered in Indiana, and are franchise free. Due to its sponsorship of local businesses and its efficient model for business integration, we believe that a partnership between INDOT rest areas and Indiana Originals could be very beneficial to both parties. Possible benefits for both parties include raised awareness for local businesses, better public perception of both INDOT and numerous local businesses, easy and efficient advertising space which hits a specific target market, and potential for over-the-counter sales if changes are made to Title 23. As it stands now, the cost for a business to become a member of Indiana Originals is either $15 per month or $165 per year plus a one-time $60 enrollment fee. Through a deal with INDOT, it is not unreasonable to think that advertising costs could be included in a membership fee and these businesses could be advertised as quality, local businesses all across the state to observers from across the country. Furthermore, IndianaOriginals.com already features a rotating primary advertisement section for premium members and a welcome video which features all premium-member businesses as well. This system could easily be integrated within advertising spaces or displays in INDOT rest areas. However, the membership fees for premium Indiana Originals members do jump up to either $240 per month or $2,640 per year. This idea is more centered on the principle of goodwill and positive relations towards local Indiana businesses. While it may not have the capacity to generate the same amount of revenue as some of the other ideas, a partnership between INDOT and Indiana Originals does have the ability to influence the way that consumers view both parties and how likely they are to use either INDOT's facilities or a local business' in the future (Stone & Stone, n.d.).

RANKING 5—PARKING LOT SENSORS

Finding appropriate parking takes time, costs money, and can have the tendency to create frustration. Many high traffic areas have been implementing parking lot sensors to help fill more spaces, reduce parking time, increase parking capacity, reduce circling traffic, and even reduce cost and emissions. New parking sensors can be installed in each parking space and have the ability to detect a car's presence in that space. If a car is present, the sensor then transmits that data to a receiver that is connected to a number of different software applications. It is often connected to a sign or display which notifies drivers of how many parking spaces are available, however it could also be used to alert drivers of parking availability via a car or smartphone's GPS system. The cost for a parking lot sensor system varies substantially but is primarily based on two criteria, the first being the number of parking lot sensors needed and the second being the chosen software services. Popular Mechanics magazine suggests that the cost of these sensors is usually between $200 and $400 per parking spot. Most parking lot sensors require zero maintenance and the battery (depending on the brand) will last between 5 and 10 years. Studies have shown that in High traffic areas, circling to find parking spots can account for between 15% and 20% of the overall traffic. These sensors have the ability to reduce time spent finding a spot by up to 20 minutes per driver per day, which could help cut down on emissions and fuel costs for the consumer. SFpark in San Francisco has been charging anywhere between $0.25 and $6 per hour for the use of similar software and parking sensors. The software used by SFpark also have a dynamic pricing feature which adjusts the cost of parking depending on the number of available spots in that specific area. In INDOT's case, revenue could be generated by payment from users who wish to reserve their parking spot ahead of time, which could apply specially to truck drivers who know exactly when they will be stopping for rest. Since the sensor's require little to no maintenance, the technology's potential to quickly earn back its initial investment is high (Bosch Connected Devices and Solutions, n.d.a., n.d.b.; Burnett, 2019; Ross, 2011).

RANKING 6—PHARMACEUTICAL VENDING MACHINES

One of the very innovative and public oriented idea is the pharmaceutical vending machines. As quick help (over the counter medicine) and first aid are not easily accessible when travelling on an interstate, you might need to travel a substantial distance into the nearest city/town to find a pharmacy or a hospital. Whereas need for such medical help can be urgent sometimes. Setting up pharmaceutical vending machines on rest stops can help the commuters with availability of such medical help on the interstate itself. Recently, many pharmaceutical companies have started making such vending machines available at remote locations and other locations where they might be needed the most, like airports, hotels, transportation hubs and university campus. CVS, InstyMeds Corp, UCaplt are some of the companies that provide such dispenser machines. They can cost from $500 up to $10,000 with some companies giving the option to rent. These machines can hold up to 1,000 drugs or self-help medi-kits depending on the size. The most commonly sold over-the-counter drug in the U.S. is acetaminophen, commonly known as Tylenol, and costs around $13 for a supply of 50 tablets. At this price, the sales of Tylenol alone could make up for the cost of a $1,000 vending machine in just 77 transactions. When combined with the sales of other medications, initial costs could be recovered very quickly. In comparison, the average earnings for an independent pharmacy in 2017 were as high as $136,000 even though the profit margins have declined over the years. These dispenser machines can be set up in

collaboration with a local health care center which the commuters can visit in case of emergency or if they need to see a doctor. A telephone line or video link can also be setup for commuters to contact the hospital directly from the dispenser machine. A vending machine would require an operator to update inventory on a regular basis, that service could be provided by current operators (CVS Health, 2017; Drugs.com, 2019; Fein, 2019; Garcia, 2011).

RANKING 7—EXPRESS LAUNDRY SERVICE

Semi-truck drivers and families with kids would appreciate an express laundry service that could be provided at the rest areas. Survey results from a report by the Iowa Department of Transportation from 2018 show that the average person spends only about 5 to 10 minutes at a rest stop, so it needs to be sure that the washing/drying cycle time is a short and efficient as possible. In order to combat this time constraint, washers and dryers that have short cycles were studied. The least expensive washing machine in the U.S. which can run a 20 minute or less cycle is the Electrolux 4.3 cu. ft. front-load washer which costs approximately $700. The least expensive dryer which can dry clothing in about 30 minutes or less is the Maytag MEDC465HW which costs approximately $700 new. Overall, this option would cost around $1,400 per rest area, unless sales or bulk discounts on washers and dryers can be found. With the average cost per washer load and dryer load at laundromat being $1.50, it would require about 900 loads to pay back the investment cost. If there are at least 2 to 3 loads per day, the investment will be returned in 1 year. Overall, an express laundry service in rest areas seems like a viable option to both increase consumer satisfaction and to also bring in some revenue to fund itself. Money to cover the costs of these washing and drying machines could be collected by a coin or a card reader before the consumer uses it (Appliance Insurance, n.d.; Home Depot, 2019; Rawes, 2019).

RANKING 8—SOLAR ENERGY SOLUTIONS AND THEIR APPLICATION AT REST AREAS

Solar energy is slowly becoming easier and cheaper to capture and utilize across the world. New innovations in solar panel technology are flooding the market, making it a seemingly ideal time to begin implementing this tech in areas where it has not been seen to this point. According to Project Sunroof it takes about 15–20 years to regain the initial upfront financial investment in Indiana based on the amount of direct sunlight Indiana gets per year. The average national solar panel cost is $2.98 per watt. Solar panels do require annual cleaning that can cost $3 to $10 to clean per panel, and any damaged panels can cost an average of around $650 to repair. However, once a solar panel is paid off all the energy that it is able to capture becomes pure energy savings, helping to create more sustainable rest areas. The average solar panel can produce 30 kWh of energy per month. To put this energy production into perspective, the average home in the U.S. uses approximately 900 kWh per month. The effectiveness of these solar panels will vary depending on location and tree coverage in the surrounding areas, but the long-term potential for savings by using solar panels is extremely high, especially as the technology continues to become more affordable. The energy generated by the solar panels can be used to supply the rest areas, and make them autonomous (Home Advisor, 2019b; Zientara, 2019).

For example, the solar energy can be used for the parking lot lighting. The parking lot lighting is crucial in making visitors feel safe in an unfamiliar area, and it has the ability to be greatly benefitted by the installation of solar panel technology. Parking lot lighting also provides visibility to easily navigate the parking lot and promotes cleanliness. At this point in time, LED parking lot lights are the optimal choice. LED lights require less maintenance, much less energy, and provide brighter, more powerful lighting as opposed to traditional lights. A switch from traditional lighting to LED can save between 63% and 79% in energy usage and, according to one case study, save over $6,800 in maintenance costs. Quality LED parking lot lights cost approximately $1,000 to $1,500 per light. The number of lights needed will vary depending on the size of the parking lot and the light chosen for implementation. A switch from traditional to LED lighting has a steep up initial cost, but it saves massive amounts of energy and maintenance time in the long-term. These new parking lot lights could become entirely self-sufficient if combined with the use of solar panels. By powering the lights with solar technology, INDOT could eliminate the operating costs of the lights, while still generating additional electricity which could be sold to a business such as Duke Energy for a profit, whose standard rate is $0.13 per kWh 9 (INDOT, 2013; Matasci, 2019; Solar Reviews, n.d.; U.S. Department of Energy, 2013).

RANKING 9—SEMI-TRUCK PLATOONING

Many trucking companies are entertaining the concept of platooning, or the linking of two or more vehicles in a convoy by using connectivity-based technology to travel together while still maintaining a safe distance from each other and other vehicles on the road. Energy.gov suggests that 65% of the miles traveled by trucks today could be platooned and that platooning can decrease total truck fuel consumption by 4%. The concept of platooning is one that is not new, but is currently in the process of being improved by various companies such as FedEx, Schneider, etc. Today these companies are testing new technologies in autonomous vehicles which would allow platoons of trucks to drive along highways with only one driver operating the leading vehicle. This process will have a largely positive impact on safety, emissions, and efficiency by eliminating driver error, cutting fuel usage,

and reducing time needed for stops, respectively. In order for these vehicles to move as a convoy, however, they first need to assemble somewhere to link together. One possible location for the assembly of these trucks for platooning could be INDOT rest areas. INDOT could allow these companies like Fedex and Schneider to assemble their trucks for platooning in rest area parking lots in exchange for a small fee. To this point, 22 different states in the U.S. have passed legislation which concern autonomous vehicles, including Indiana. Indiana's Bill, which was passed in 2018 defines "Vehicle platoon" to mean a group of motor vehicles that are traveling in a unified manner under electronic coordination at speeds and following distances that are faster and closer than would be reasonable and prudent without electronic coordination. The assistive driving and collision avoidance systems in these platoons can cost between $2,000 to $3,000 upfront but the payback for fleets is currently difficult to measure. At this moment, we have not been able to find reliable numbers and figures on prices being charged to trucking companies for this activity, but it is believed that as the concept of platooning and the usage of autonomous vehicles continue to grow that the feasibility of this idea as a revenue stream will grow as well (European Automobile Manufacturers Association, 2017; Indiana General Assembly, 2018; National Conference of State Legislatures, 2019; Office of Energy Efficiency & Renewable Energy, 2018; Peloton Technology, 2019).

RANKING 10—COMPRESSED NATURAL GAS STATIONS

In today's world, with the increasing pollution due to carbon emission and reduction in fossil fuel dependent fuel, the use of alternative fuels is essential. Compressed Natural Gas which is 50% cheaper than the gasoline and emits 25% less CO2 is one such alternate source that can be very economical for rest stop areas. According to the U.S. Department of energy, there are three types of CNG gas stations. These different types cater to different groups of commuters since they have different features. There are a lot of factors that decide the setting up of a CNG station. A basic CNG station cost ranges from $10,000 to as high as $1.2 to $1.8 million based on the storage capacity, and the number of vehicles it can service at a time. The average cost in the U.S. for a "gallon" of CNG is $2.27. A CNG station is an idea INDOT should explore since according to GE, currently there are 250,000 natural gas vehicles on the road in the U.S. A lot of U.S. airports, corporate companies and government agencies are converting their fleet of vehicles to CNG-based. A time-fill station that serves a fleet can be profitable for INDOT since the cost of setting up a time-fill station is less compared to fast-fill station and there is a scheduled window for fueling the fleet (CNG Now, n.d.a, n.d.b; Economic Times, 2014; Smith & Gonzalez, 2014).

CONCLUSIONS

This report provides a set of possible ideas to improve rest area economics under the rubric of Rest Area 2.0. The composition of individual rest areas may vary but permitting shorter term leases and software-based displays, and permitting variable pricing based on user needs, may be key to enabling the combination of service and revenue sustainability. While revenues are a concern, showcasing local tourism and partnering with IndianaOriginals may enable INDOT to generate goodwill and thus added enthusiasm to upgrade rest areas. We have been careful to prevent competition with existing businesses so that recommendations are in compliance with existing Federal regulations regarding rest area businesses. Rest Area 2.0 has the opportunity to showcase state assets and communicate that INDOT and Indiana are a state that embraces the future.

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APPENDIX

APPENDIX

Solution	Cost per unit	Revenue per unit	Payback period	Any additional requirements
High-speed internet service	$250 per month	$5 per hour	Assuming 50 people use the service for 1 hour per month, cost can be recouped every month	High-speed internet modem and routers
Parking lot sensors	$300 per parking spot	$3 per hour	Assuming 10 people use the service an average of 2 hours in a month, cost can be recouped in 5 months	Batteries
Solar energy solutions and its use for e.g., parking lot lighting	$2.98 per watt. Installing an average solar panel system (approx. 6kW) costs $12,516 after tax credits	10.53 cents per kWh (1 solar panel of 65×39 inches generates 30 kWh per month). LED bulbs use 212.5 kWh energy over 25,000 hours	15 years. Assuming lights on for 10 hours/day, electricity generated in 7 months can power 1 LED bulb for 83 months	Annual cleaning of solar panels
Interactive touch screen display	$6,500 including installation, maintenance, card reader, software	$600 per month	Assuming 100 people use the service at $0.20 per day, cost can be recouped in 7 months	Maintenance
Express laundry service	$1,400 per set of machines (washer and dryer)	$3 per load	Assume 100 customers a month, cost can be recouped in 5 months	Maintenance, collection of money
Pharmaceutical vending machines	$1,000 per month	$20 per customer	Assuming a sale of 50 tablet Tylenols at $13, just 77 sales of Tylenol recoups the cost	Maintenance, inventory supply
CNG station	$50,000 mid-size station	$600 per bus per week ($2.00 per gallon CNG)	Assuming a CNG bus uses 300 gallons of fuel per week (1,000 miles/week @ 3 MPG)	
Electric vehicle charging station	$550 per Level 2 charging station	$3.90 per 100 miles	A car requires full charge every 100 miles. 420 vehicles requiring full charge recoups the cost	Maintenance

Note: Except for the vending machine, none of the options require an operator at the rest area on a regular basis.

Draft—Rest Area Survey

1. Rest area location: _____
2. Was the rest area:

	Yes	No
Safe		
Clean		
Convenient		

3. Rate the following at this rest area:

	Poor	Average	Excellent
Parking lots			
Rest rooms			
Grounds			
Picnic facilities			
Vending			
Sidewalks			
Tourist information			
Overall			

4. Would you like to see the following at this site?

	Yes	No	Waste of money
Wireless internet			
Access to an app with music, books, videos to download			
Access to tourist information, e.g., weather, traffic			
Electric vehicle charger			
CNG station			
Pharmaceutical vending machine			
Other type of vending machine			
Wash and dry			
Express medical help			
Ability to reserve parking space in advance			
Access to information about local businesses			

5. How many minutes were spent in the rest area?
   - 0–5 minutes
   - 5–15 minutes
   - 15–30 minutes
   - 30 minutes to 1 hour
   - More than 1 hour

6. I'm driving:

Car/pickup	
RV	
Semi	

7. Residency:

In-state	
Out-of-state	
Out-of-country	

8. What is the purpose of your trip?

Business/work	
Vacation/recreation	
Shopping	
Moving	
Other	

9. What is the primary purpose for stopping?

	Yes	**No**
Use toilet		
Use picnic area		
Use vending machine		
Rest/sleep		
Stretch/walk		
Allow children to play/sleep		
Walk/water pets		
Change drivers		
Get tourist information		
Check/repair vehicle		
Other		

10. Do you have any suggestions on additional services that could be offered at this rest area?

About the Joint Transportation Research Program (JTRP)

On March 11, 1937, the Indiana Legislature passed an act which authorized the Indiana State Highway Commission to cooperate with and assist Purdue University in developing the best methods of improving and maintaining the highways of the state and the respective counties thereof. That collaborative effort was called the Joint Highway Research Project (JHRP). In 1997 the collaborative venture was renamed as the Joint Transportation Research Program (JTRP) to reflect the state and national efforts to integrate the management and operation of various transportation modes.

The first studies of JHRP were concerned with Test Road No. 1—evaluation of the weathering characteristics of stabilized materials. After World War II, the JHRP program grew substantially and was regularly producing technical reports. Over 1,600 technical reports are now available, published as part of the JHRP and subsequently JTRP collaborative venture between Purdue University and what is now the Indiana Department of Transportation.

Free online access to all reports is provided through a unique collaboration between JTRP and Purdue Libraries. These are available at http://docs.lib.purdue.edu/jtrp.

Further information about JTRP and its current research program is available at http://www.purdue.edu/jtrp.

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