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ID.me City of San Diego Pilot Evaluation

Final Report

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Executive Summary

This document is an evaluation report for the San Diego (SD) ID.me pilot. The ID.me pilot was launched in SD in February 2019 with the aim of facilitating access to discounts at the Torrey Pines Golf Course (TP) by proofing identity and verifying residence within the city for those applying for Resident ID Cards. SD's goals for implementing the ID.me pilot were to increase operational efficiency and cost-effectiveness, improve security and fraud prevention, and improve the consumer experience. As part of NIST's efforts to facilitate compliance with National Strategy for Trusted Identities in Cyberspace (NSTIC) guidelines and assess the impact of its grants, RTI International worked with ID.me and TP staff to conduct an economic evaluation of the ID.me pilot. This report documents the methods we used to assess the pilot's impact and presents the main findings of the evaluation.

Removing the need for TP staff to process Resident ID Cards in person increases operational efficiency by freeing up staff time to conduct other job responsibilities. Improved security and fraud prevention result from the ID.me identity and residency verification process, which is more likely to catch attempts by ineligible individuals to fraudulently obtain Resident ID Cards to take advantage of large tee time discounts for SD residents. Finally, the pilot improves the consumer experience by allowing residents to conveniently verify their residency and purchase their Resident ID Cards online. Moreover, TP staff have more time to provide TP guests with excellent customer service and to maintain the high-quality standards of the golf course.

We identify strong pilot uptake and operational benefits. Over the lifespan of the pilot, there was an increase in the year-on-year number of monthly Resident ID Cards sold by TP as well as an increase in the percentage of successful online verifications and the percentage of online verifications that resulted in Resident ID Card purchases. Over the first year after pilot launch, we estimate that staff time spent processing Resident ID Card applications was reduced by 187 hours, with a monetary value of $3,463 based on staff salaries, and that the pilot generated a net loss reduction of almost $400,000 from fraud. We also forecast the impact of the pilot for the coming 5 years and estimate that the total net present value (NPV) of the pilot from February 2019 through January 2025 is over $2 million. Staff time saved over the same time period is estimated to be almost 10,000 hours.

User survey results indicated positive feedback among those who renewed their Resident ID Card online with an average willingness-to-pay for the ability to renew online of an additional $5.5 on top of the current $25 fee. Results indicate nearly unanimous agreement

among those who have or plan to renew online about the importance of their online security and privacy with slight hesitation about the ID.me identity verification process centering around needing to provide one's SSN. Respondents were twice as likely to indicate that they planned to renew their Resident ID Card online than that they had already done so. In addition, over 30% of respondents who did or planned to renew in-person were unaware of or did not understand how to renew online.

Stakeholder interview findings indicate that the pilot led to substantial benefits in efficiency and enhanced security. Moreover, the pilot was a strong asset during the COVID-19 pandemic, which prevented in-person visits to the golf courses for some time. Even after TP was re-opened, it helped reduce the amount of time residents had to spend indoors applying for Resident ID Cards. The main drivers for the pilot's success included comprehensive preparation, planning, and communication between all teams involved. NIST's grant funding played a significant role in SD's decision to adopt the ID.me pilot by providing SD with an opportunity to test advanced technology at no cost.

The ID.me solution is scalable and therefore SD is exploring options to implement it in additional agencies where identity proofing and residence verification are needed. Examples include park district class registrations as well as the library, fire department, and environmental services department use cases. Features that help with the scalability of the ID.me solution are the presence of a web interface and the presence of an API functionality that can be integrated into any kind of software. Impediments to scalability are restrictive regulations and local government's tendency to be slow to adopt new technology solutions.

There were challenges to the pilot implementation including difficulties with third-party vendors and issues with verifying identities in situations that were not straightforward. One lesson learned from these challenges is to establish robust communication with third-party vendors along with a system for holding these parties accountable for their roles in ensuring the pilot's success. Another is to verify at the outset that an identity solution is properly designed to flag false positives and to anticipate potential implementation issues and develop contingencies for setbacks if they occur.

Additionally, there were difficulties setting up a kiosk at TP, the goal of which was to facilitate in-person proofing. Consequently, TP and ID.me decided to switch to a more cost-effective, iPad-based solution to replace the kiosk. Finally, there was some push-back from users regarding the need to submit their SSN, which led TP to keep in-person proofing open as an option for some time. The lesson from this situation is to anticipate public perception and tailor messaging to reduce potential misconceptions and consequent pushbacks.

1. ID.me—City of San Diego Pilot Summary

ID.me is partnering with the City of San Diego (henceforth SD) to promote the adoption of trusted digital credentials that allow users to access benefits and discounts. The goal of this pilot was to promote the NSTIC guidelines and accelerate their adoption in SD's Parks and Recreation Department through leveraging and expanding on ID.me's existing identity solutions. Although the ID.me pilot solution was only currently implemented at the Torrey Pines Golf Course (henceforth TP) in SD, it provides a gateway to similar implementations on a wider scale across government sectors. Below, we provide a detailed description of the ID.me pilot and its objectives.

1.1 Background

The SD Parks and Recreation Department is responsible for providing golf services and recreational programming for SD citizens and nonresident visitors. There are five facilities and three golf courses, where over 320,000 rounds of golf are played annually. As opposed to private, for-profit golf courses, the SD Parks and Recreation Department is a public-facing agency and is thus responsible for offering both service and value on the properties it manages. Operational and managerial efforts, therefore, strive to provide excellent service at reasonable prices.

The leading golf course managed by the agency is TP, which is a PGA tour staple and a United States Golf Association (USGA) Open golf course and, therefore, demands high costs to maintain and manage. Maintaining the golf courses allows SD to remain competitive among competing courses and to maintain its affiliation with the PGA and USGA.[1] The superior quality of the golf courses and the high customer service standards set by SD create very high demand among golfers for playing at these golf courses, especially TP. SD residents are allowed to play at TP at a significant discount. Coupled with the high demand for the TP golf course, this creates a strong motivation for individuals to circumvent the identification (ID) verification process in an attempt to fraudulently obtain Resident ID Cards despite lack of eligibility.

1.2 ID.me Pilot Description and Objectives

The ID.me pilot was launched in SD in February 2019 with the aim of facilitating access to discounts at TP by proofing identity and verifying residence within the city for those applying for Resident ID Cards.[2] An individual applying for the card creates an ID.me account and uses it to verify their identity online. The integration work of provisioning the

[1] Affiliation with the PGA and USGA provides recognition and promotes brand awareness at TP, which has become very high profile. For example, Tiger Woods won the U.S. Open at TP in 2008. Therefore, the Parks and Recreation Department is keen on maintaining the golf course at the required standards.

[2] SD operates three golf courses: Balboa Park, Mission Bay, and Torrey Pines. Currently, the scope of the pilot only involves Torrey Pines.

Resident ID Card is completed through foreUP, a third party.[3] Originally, a self-service kiosk was planned to be placed at TP to allow for automated in-person proofing and to provide video links for call center support. However, the implementation of this solution ran into issues that ultimately resulted in a switch being made to use tablets and personal cell phones instead. We discuss this challenges with this solution in more detail in Section 7.

SD's goals for implementing the ID.me pilot were to increase operational efficiency and cost-effectiveness, improve security and fraud prevention, and improve consumer experience. We elaborate on each of these goals below.

1.2.1 Efficiency and Cost-Effectiveness

The ID.me solution cuts down on labor intensiveness by alleviating the need for staff to process Resident ID Cards. The benefits of this are twofold: 1) it saves staff time and reduces administrative costs and 2) it removes the need to have staff examine personal documents necessary to verify ID and residency.

Staff Time Savings and Administrative Cost Reduction

From a staff resource standpoint, processing Resident ID Cards is the task that most consumes staff time in a way that is disproportionate to realized returns. Every year, approximately 25,000 residence cards are sold.

Identity proofing for the Resident ID Card entails proving the person's identity and proving that the person is a resident of SD. Eligibility requirements for residency are that the person lives within the city proper of SD and that their council district is represented. Staff use an ArcGIS map to cross-reference that data. An individual can prove residence for the Resident ID Card using five credentials:

1. Property tax statement
2. Driver's license
3. Auto registration
4. Student ID for a brick-and-mortar campus in SD
5. Military ID and is stationed in SD

In-person verification, therefore, generates high administrative costs. At TP, there is an office with a call center and an administration desk where a person can walk in and present one of the aforementioned documents to prove residence and purchase a card.[4] The staff create an account for the individual with their contact information and address, which is then tied to the card. The resident can then log into the TP website, using the username and password they used to set up the account, and reserve tee times.

[3] To access the system, a resident would go to https://foreupsoftware.com/index.php/booking/index/19347#/account/reservations, create an account, then navigate to Account Information.
[4] A driver's license is the most common credential used.

The solution offered by the ID.me pilot removes the burden of ID proofing from TP staff. Individuals can be remotely identity-proofed online and, when issues arise, be helped via technical support (email, chat, help desk call) without adversely affecting other people who want to access the golf courses.

Avoidance of Handling Personal Documents

Verifying identity and residence entails having staff at TP reviewing personal documents necessary for this verification such as tax documents, auto registration documents, utility bills, and house titles, for example. Because staff are not trained in dealing with documents of this nature, verification places a significant burden on them in terms of time spent and increased responsibility beyond their other job duties.

1.2.2 Security and Fraud Prevention

The Resident ID Card Program entitles SD residents to discounts at three golf courses, including substantial discounts at TP.[5] For example, on the South course, the fees for the weekend are $78 for a resident versus $252 for a visitor. These savings make the Resident ID Card Program a target for fraudulent activity, motivating individuals to manipulate the system to falsify eligibility for a Resident ID Card, especially since they only cost $25, much less than the discount for the use of the golf course for 1 day.

The ID.me proofing solution is regarded as a way of cutting down on fraudulent attempts to purchase a Resident ID Card. For example, many users attempt to use business addresses within city limits as proof of residence when applying for a discount Resident ID Card. The ID.me identity proofing solution and residency check will help ensure that users must be approved based on their mailing address reported in telecoms and on official identity documents, as opposed to a piece of paper with a business address.

With the pilot, the role of ID.me was to verify that each applicant is who they say they are and that they meet the requirements of residence eligibility set by SD. The solution allows users to self-verify using their ID.me accounts in accordance with federal standards (NIST 800-63-3) and includes automated checks for:

- Physical ID document verification (e.g., one of the following: driver's license, state ID, passport, passport card)
- Validation in financial records via the Social Security Number
- Fraud checks (fraud history, geolocation, velocity, watch list, etc.)
- Mobile Network Operator checks (account tenure, device tenure, SIM Swap, and Phone Port history)

[5] Lesser savings are available to SD residents at Balboa Park and Mission Bay. For example, residents pay $40 at Balboa Park, while non-residents pay $50.

In addition to blocking fraudulent attempts by individuals to obtain Resident ID Cards despite ineligibility, the pilot also further reduces staff time associated with addressing fraudulent applications. Because fraudulent attempts involve fabricated documents or the use of business addresses to prove resident status, it takes staff time and effort to disprove authenticity.

1.2.3 Improving Consumer Experience

A Resident ID Card must be renewed each year. Before implementing the pilot, an individual had to purchase a Resident ID Card in person at any of the three golf courses to qualify for discounts. As mentioned above, this process involves potentially long lines, creating an inconvenience to both the individuals who want to access the golf courses and the administrative staff at TP. Removing the burden of processing Resident ID Cards applications from office staff allows them to dedicate their time to providing services to TP visitors, whose experience at TP will be improved. Visitors will also not need to wait in line behind individuals applying for or renewing their Resident ID Cards, a process that takes at least several minutes per application.

2. Methods

Taking the pilot objectives into account and coupling them with adherence to NSTIC guidelines, we took a four-pronged approach to estimate the economic impacts of the pilot. We employed the following methods, described in greater detail in the subsections below:

1. Collected and analyzed operational and impact metrics—quantitative descriptors of the pilot in terms of its scope and scale in addition to its alignment with the Identity Ecosystem Framework (IDEF) and the impacts on users.
2. Conducted surveys of users to gauge their perceptions of convenience, security, and privacy associated with the pilot.
3. Reviewed the pilot's impact on the likelihood, scale, and consequences of security incidents, privacy breaches, or fraud activities.
4. Conducted a document review and interviews with pilot team members and stakeholders to gauge qualitative pilot impacts and lessons learned.

2.1 Operational and Impact Metrics

These metrics facilitate the assessment of the scale of the pilot indicated by the number of users and by how often they use the pilot services. Over time, measuring operational metrics gives an idea about the potential impacts that are attributable to the pilot, especially if coupled with user surveys. Moreover, these metrics facilitate the assessment of whether the pilot aligns with the IDEF guidelines. The goal of collecting impact metrics is to help assess whether the pilot performance has achieved its target and whether it aligned with the guiding principles of NSTIC, the IDEF guidelines, and the objectives set forth by ID.me. Table 2.1 outlines the metrics collected from TP staff along with the date range that the metrics are collected over.

Table 2.1. Metrics Collected from TP

Metric	Date(s)
Amount of time taken to process a Resident ID Card in person in minutes	Constant over time
Amount of time taken to process a Resident ID Card online in minutes	Constant over time
Staff cost per hour in USD	Constant over time
Cost per digital credential	Constant over time
Cost per physical Resident ID card	Constant over time
Monthly Resident ID Cards sold	July 2016–Jan 2020
Digital ID.me credentials issued	Feb 2019–Jan 2020
Online Resident ID Cards sold	Feb 2019–Jan 2020
Revenue of Resident ID Cards sold	July 2016–Jan 2020
Total number of identity verification attempts	Feb 2019–Jun 2020

(continued)

Table 2.1. Metrics Collected from TP (continued)

Metric	Date(s)
Total number of unsuccessful identity verification attempts	Feb 2019–Jun 2020
Number of existing ID.me users that have used the pilot	Feb 2019–Jun 2020
Number of new ID.me users that have used the pilot	Feb 2019–Jun 2020
Annual number of rounds played at the TP golf courses	2017-2020
Time spent in line at TP to purchase an ID card	Pre-pilot and post-pilot
Average number of fraudulent attempts per week	Pre-pilot

2.2 Survey of Users' Perceptions

The pilot aims to enhance convenience, security, and privacy for users. In addition to analyzing the metrics mentioned above, we conducted a user survey to solicit their perceptions about the pilot and its impact. RTI designed a survey using Alchemer software and created a public survey link. TP staff shared the survey link with SD Golf District members through its monthly newsletter in February 2020. A reminder was printed in the April 2020 newsletter. The messaging from each newsletter is provided in Appendix A along with a copy of the survey questions.

RTI drafted survey questions with input from TP and ID.me. The survey included questions asking participants about the following:

- motivation for engaging in the pilot
- perceptions about the security of the solution
- perceptions of the technology's ability to protect their privacy
- experience using the technology (i.e., ease of use)
- degree of satisfaction with the convenience of the pilot or reduction in the time taken to complete the issuance of their Resident ID Card
- demographics (e.g., age, gender)

2.3 Privacy and Security Review

ID.me aims to provide individuals with access to benefits in a secure and convenient way by being able to prove their identity online and being in control of their personal information (ID.me, 2018).[6] As mentioned above, one of the main pilot objectives for TP staff was to prevent the purchase of Resident ID Cards by ineligible individuals. Consequently, security and privacy play a primary role in determining the success of the pilot.

[6] ID.me website. (2018). About ID.me. Accessed online on 3/9/2018 at: https://wallet.id.me/about

Kuma LLC, a privacy and security consulting firm, acted as subject matter experts for evaluating privacy and security in the ID.me digital identity solution. Kuma and RTI visited the TP Golf Course (September 2019, October 2019) to discuss the security implications with TP golf staff, in addition to reviewing the functionality of the proofing features with ID.me stakeholders.

Importantly, it should be noted that the complete Privacy Risk Assessment Methodology (PRAM) analysis was not provided for review to the evaluation team for any of the NSTIC State Pilots including the one covered in this report. Therefore, evaluation of identified privacy or security risk, or of any mitigation or remediation controls, based on the NISTIR 8062 was not possible. Thus, implicated privacy and/or security risks – and any mitigating or reductive effects of the pilot technology or solution – cannot be confirmed or refuted.

3. Operational and Impact Metrics Results

This section presents the quantitative impacts of the ID.me pilot, including the number of users affected, time and cost savings, and value added from the pilot features. We include metrics from July 2016 through January 2020, during which time the pilot was in effect from February 2019 through January 2020. Our assessment indicates that over the lifespan of the pilot, there was an increase in the year-on-year number of monthly Resident ID Cards sold by TP as well as an increase in the percentage of successful online verifications and the percentage of online verifications that resulted in Resident ID Card purchases.

We found that over the first year after pilot launch, staff time spent processing Resident ID Card applications was reduced by 187 hours, with a monetary value of $3,463 measured using staff salaries. Additionally, we estimated that over the same time period, the pilot prevented about $402,689 in fraud-related losses. Profits from the sale of Resident ID Cards were reduced by $3,170,[7] and the cost of the online credentials further decreased Resident ID Card profits by $11,856. Therefore, the estimate of the net monetary effect of the pilot over the first year of the pilot was almost $387,663. We also forecasted the impact of the pilot for the coming 5 years and estimated that the total net present value (NPV) of the pilot from February 2019 through January 2025 is over $2 million. Over the same period, we estimate staff time savings to be almost 10,000 hours.

3.1 Number of Users and Passes

We examined several metrics related to the number of users and passes that inform our estimation of the pilot impacts. These include the number of ID.me credentials issued, the number of Resident ID Cards sold online, and the total number of Resident ID Cards sold. We track the total number of Resident ID Cards sold from July 2016 through January 2020, while the other two metrics are reported starting with the pilot implementation, February 2019 through January 2020.

To gain a better understanding of potential pilot impacts, we compared the monthly sales of Resident ID Cards for 12 months after the launch of the pilot (February 2019 through January 2020) to the same period in the 2 years before the pilot. These metrics are displayed in Figure 3.1. As the figure shows, the number of monthly sales is significantly higher during the first year after pilot rollout compared with the 2 years prior. In numbers, the growth rate of the annual sum of Resident ID Card sales went from 5.7% in 2018 to 26.6% in 2019 using the February through January time frame. Even though we cannot conclusively attribute this large increase in card sales to the pilot, the results may suggest that the ability to verify identity and residence in addition to making card purchases online

[7] Despite the reduction in the cost of staff time spent processing applications in person, the per-person cost of the online credentials outweighed those reductions, resulting in an overall reduction in profits from Resident ID Card sales.

may have incentivized some individuals to purchase their cards remotely even before they had plans to play.

Figure 3.1. Monthly Resident ID Card Sales February 2017–January 2020 by Year

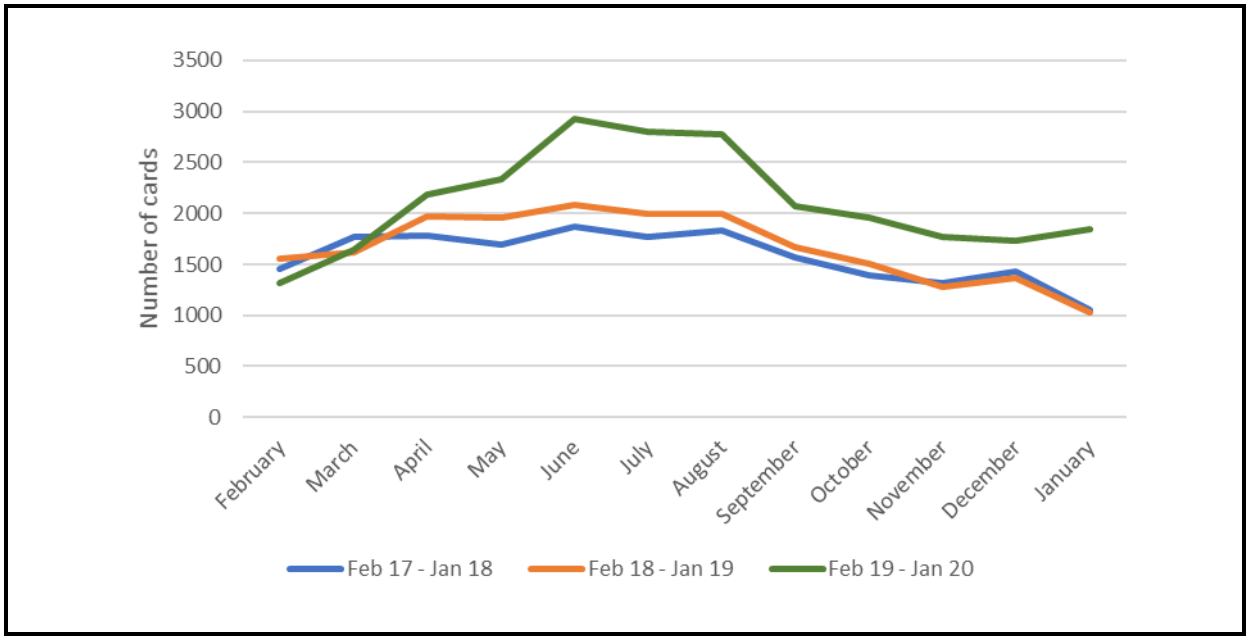
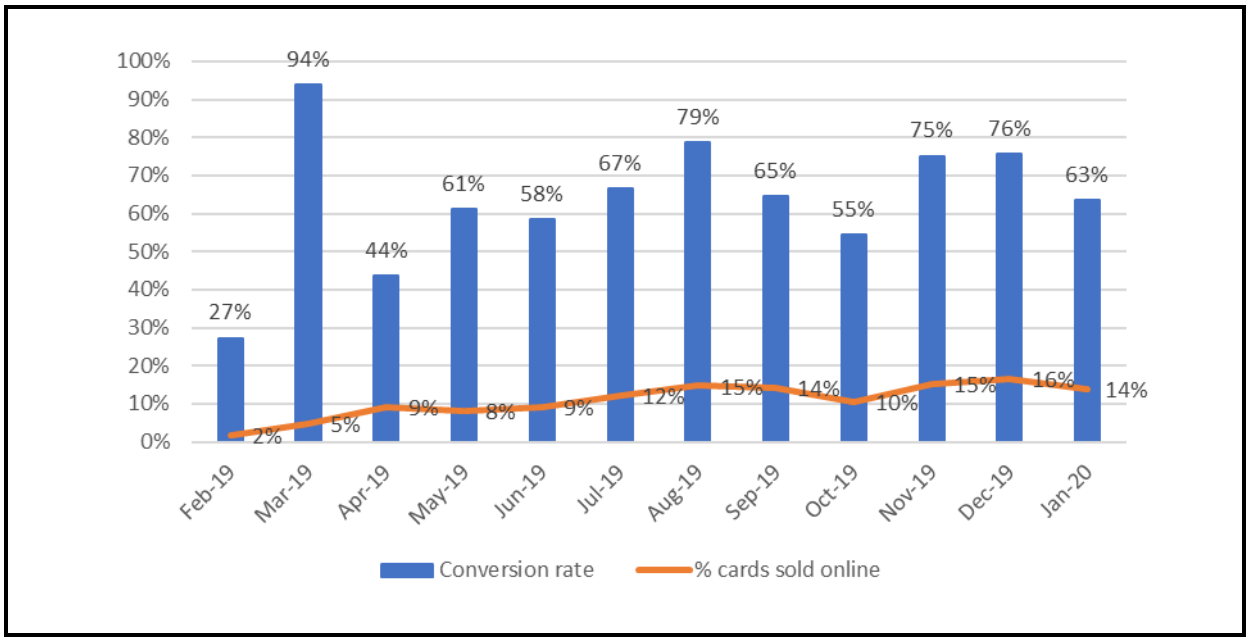


Figure 3.2 shows the monthly percentage of Resident ID Cards purchased online as well as the conversion rate, or the percentage of online verifications that resulted in online card purchases.[8] Even though the goal of TP staff was to have cards purchased exclusively online in the future, the average percentage of cards sold online during the first year after pilot rollout was about 11%, while the average conversion rate was 64%. The significance of the conversion rate is that online digital credentials represent a cost, while cards sold represent a revenue which covers that cost. Therefore, the more digital identities resulting in a purchase the more financially sustainable the solution is.

[8] The conversion rate is the number of ID.me credentials or online verifications divided by the number of Resident ID Cards sold online. The percentage of cards sold online is the total number of cards sold divided by the number of Resident ID Cards sold online.

Figure 3.2. Conversion Rate* and Percentage of Resident ID Cards Sold Online by Month



* The percentage of online verifications that result in card purchases.

One reason why some users preferred to purchase their cards in person is their reluctance to upload personal documents online. However, the more important reason for the low conversion rate and percentage of cards sold online has much to do with payment problems that users experienced after being verified online. We discuss this issue in more detail in Section 7. Nonetheless, as we see in Table 3.1, the 3-month average of conversion rates rose throughout the first year of the pilot.[9]

Table 3.1. Conversion Rate[a], 3-Month Averages During the First Year After Pilot Rollout

Feb 19–April 19	May 19–July 19	Aug 19–Oct 19	Nov 19–Jan 20
55%	62%	66%	71%

[a] Conversion rate: percentage of online verifications resulting in online purchase.

3.2 Successful Verifications

Figure 3.3 displays the number of monthly online identity verification attempts for the period February 2019 through June 2020. The spike in May 2020 was due to the COVID-19 pandemic. Golf courses were shut down in April as part of a broader shutdown to contain the virus, leading to a slight dip in online verification attempts in April 2020. California

[9] Monthly data for conversion rates were unavailable after Jan 2020. However, the effect of the pandemic was to increase online applications relative to in-person verifications.

reopened golf courses in May 2020, so the spike in May's online verification attempts is due to an increase in residents applying for purchase or renewal of their Resident ID Cards in addition to a shift toward online workflows, as opposed to in-person verification.

Figure 3.3. Number of Monthly Identity Verification Attempts (February 2019–June 2020)

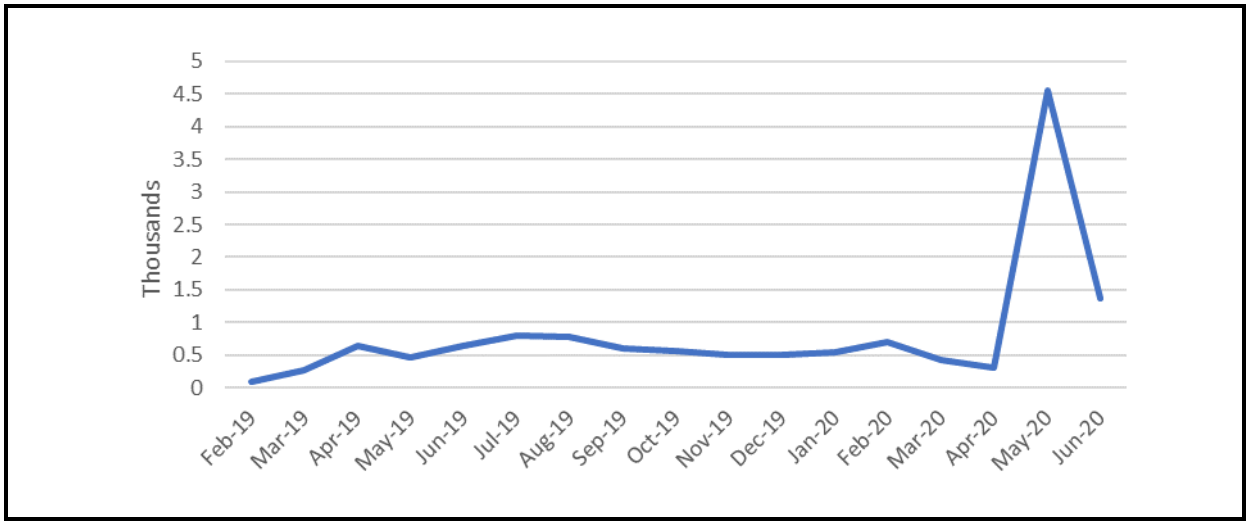
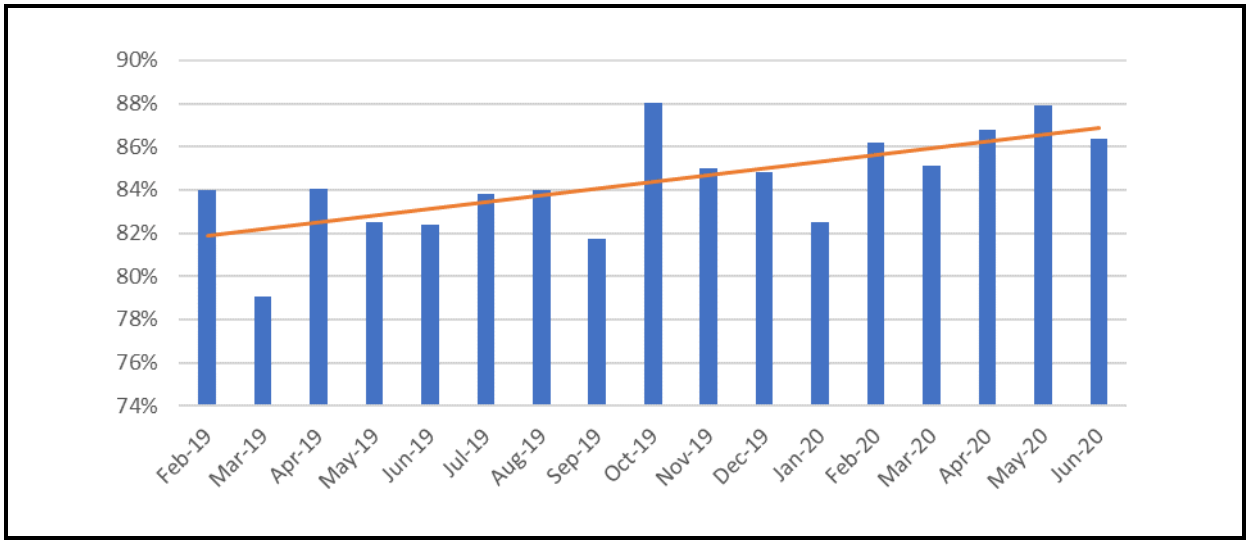


Figure 3-4 shows the monthly percentage of successful online verification attempts along with a linear trendline. The figure shows an increase in the percentage of successful verification attempts over time as technical hurdles were addressed.

Figure 3.4. Percentage of Successful Verification Attempts (February 2019–June 2020)



3.3 Time Savings and Productivity Gains

One of the main goals of the pilot was to cut down on the time spent by office staff on verifying applicants' identity and residence to reduce the costs of processing Resident ID Card applications and free up staff time to attend to other job duties, including customer service. In this section, we present the estimated average time and associated value of productivity gains for each card sold online as opposed to having cards purchased in person. We then aggregated this estimation to the total sum of cards that had been sold online since the pilot launch. To better understand the potential benefits of having cards sold exclusively online, we calculated the gains that would have accrued if all cards sold since the pilot's launch had been purchased online. Finally, we estimated the net present value of the time saved and productivity gains for the next 5 years.

In Table 3.2, we present the time saved by the pilot due to the reduced amount of time it takes to process applications that have been submitted and verified online, 30 seconds, compared with the in-person processing time, which is 4.5 minutes. We calculated the actual time saved because of the pilot using the number of Resident ID Cards sold online during the first year after pilot launch (February 2019 through January 2020), as well as the amount of time saved had all cards sold during that time been processed online. Using the average hourly rate of staff salaries ($18.50), we computed the monetary value of the productivity gains accruing from this time saved.

As Table 3.2 shows, the number of hours saved during this first year of the pilot was about 187 hours, the monetary value of which was $3,463. Had all cards been sold online during the same period, these values would have been 1,690 hours and $31,276, respectively.[10]

[10] The value of staff time saved is not equal to an increase in profits with the implementation of the pilot. Each digital credential costs $3.50 (as of October 2020), and this cost would need to be subtracted from the profit calculation.

Table 3.2. Calculations of Time and Cost Savings of Online Resident ID Card Applications from February 2019–January 2020

Line #	Item	Online (A)	In Person (B)	Difference (B – A)
Per Application				
1	Time to process (minutes)	0.5	4.5	4
2	Labor time (hours) (line 1 divided by 60)	0.01	0.08	0.07
3	Labor cost (line 2 * $18.5)	$0.15	$1.39	$1.23
For Cards Sold Online = 2,808				
4	Total labor hours (line 2 * 2,808)	23.40	210.60	187.20
5	Total labor costs (line 3 * 2,808)	$432.90	$3,896.10	$3,463.20
For All Cards Sold = 25,359[a]				
6	Total labor hours (line 2 * 25,359)	211.33	1,901.93	1,690.60
7	Total labor costs (line 3 * 25,359)	$3,910	$35,186	$31,276.10

[a] Lines 6 and 7 depict the time and costs incurred if all cards sold during the period February 2019 through January 2020 had been sold online.

In addition to saving staff time, the pilot potentially led to time savings for visitors to the TP golf courses and increased their convenience. Since visitors can verify their residence and purchase their cards online, they do not need to wait in line to make this purchase. Data provided by TP staff indicated that it took 5 minutes on average to purchase ID cards in person.

It is difficult to quantify time savings since residents would still have to spend some time purchasing cards online. However, time spent online is potentially lower than that spent in line at the office, especially if there were multiple visitors in line waiting to purchase their cards. Additionally, if residents went to the gold course solely to purchase their cards, and not to golf during the same visit, there are additional commuting time savings.

3.4 Fraud Prevention

Because fraud prevention is one of the major goals of the pilot, we estimated the potential revenues lost from the sale of Resident ID Cards to ineligible individuals who purchase these cards to make use of the large resident discounts associated with them. These individuals may have been former residents who lived in SD, but then moved to another city without changing the address on their driver's license. This may allow them to renew their Resident ID Cards years after they stop being eligible to renew them. Other individuals list SD business addresses as their residential address in their application to purchase or renew their Resident ID Cards. While the TP office staff have been able to prevent some of these fraudulent attempts from occurring, staff are confident that Resident ID Cards are still sold to ineligible individuals.

We estimated the revenues lost from ineligible golfers purchasing discounted golf rounds using assumptions described in detail in Appendix C. First, because the number of fraudulent Resident ID Card purchases is unknown, we assumed that 0.5% of cards sold are to ineligible individuals. We also assumed that each card holder purchases golf rounds 2 times a month. The resident discount per golf round varies between $87 and $174, depending on whether the round is for the South or North Course and whether it is on a weekday or the weekend. We assumed that the pilot prevents all fraud and that golf rounds purchased by ineligible Resident ID Card holders would be filled by persons paying the accurate nonresident rate. Based on these assumptions along with those detailed in Appendix C, we calculated the monetary value of fraud prevented from February 2019 through January 2020.

Table 3.3 shows that the sum of the discounts that ineligible individuals received throughout the year is estimated at $402,689, while the revenue forgone from not selling Resident ID Cards to these individuals is $3,170. The net effect is that TP avoids a loss of about $399,520.

Table 3.3. Monetary Value of Fraud Prevented by the Pilot for the Period February 2019–January 2020

Prevented decrease in golf round purchase revenue	$ 402,689
Resident ID Card revenue decrease	$3,170
Net value of fraud prevented	**$399,520**

It is worth noting that, given these assumptions, this value represents the upper limit of the value of fraud prevention. Individuals who obtain Resident ID Cards fraudulently would not necessarily have played the same number of rounds had they not obtained the resident discount, and their tee times may have been filled by eligible residents rather than other visitors paying the non-resident rate. Consequently, we used a conservative estimate of the frequency with which TP visitors golf. As evident in Section 4, the average age of the respondents to the survey RTI administered to TP visitors was 60, suggesting that a large portion of visitors to TP are retired and may golf more frequently than our assumed frequency.[11]

3.5 Aggregate Value Added and Cost Savings

The aggregate monetary impact of the pilot comprises its effect on profits from the sale of Resident ID Cards and its effect on fraud prevention. We estimated this impact for the first

[11] The caveat is that seniors and retired individuals may be more likely to respond to the survey, so the average age of the entire population of TP visitors may be younger than 60.

year of pilot implementation, for which we have available data, as well as the forecasted net present value (NPV) of continuing the implementation of the pilot solution for 5 more years.

3.5.1 First Year of Pilot Implementation

Profits from the sale of Resident ID Cards in the presence of the pilot are affected by three aspects: a) the value of the staff time saved by having residents verify their identity online instead of in person; b) the cost of each online credential and its impact on the overall cost of issuing a Resident ID Card; and c) the total number of Resident ID Cards sold and, hence, the revenue generated by their sale.

As discussed in Section 3.3, the value of (a) is $3,463. The total number of ID.me credentials sold during the period February 2019 through January 2020 was 4,377. Because the cost of each is $3.5, the total cost of (b) is $15,320. Finally, the effect of the pilot on the number of Resident ID Cards sold, (c), is difficult to estimate accurately. Although it is likely that the convenience of online verification may have encouraged residents to purchase Resident ID Cards, we cannot conclusively determine this effect. Consequently, we estimated the value of the pilot effect on Resident ID Card sales as the combined effect of (a) and (b) above. The pilot thus led to a reduction in profits by about $11,856.

Note that the value of (c) is likely to be greater than zero, which would reduce the deficit caused by the higher cost of issuing online credentials compared with the value of staff time saved by the pilot for each application. It would take approximately 552 additional cards sold to cover the reduced profits of $11,856.[12] More importantly, freeing the staff to perform other duties instead of processing Resident ID Card applications allows them to improve customer service and maintain the high quality standards necessary for TP to hold the PGA and USGA and compete with private, for-profit golf courses.

Finally, as the adoption of the pilot is increased among TP visitors and expanded to the other golf courses in SD, in addition to potentially other agencies, the number of ID.me credentials purchased by the City will increase. This will lead to a reduction in the cost of each online credential as the City purchases larger volumes from ID.me.

The aggregate value of the pilot in the first year includes the $11,856 profit reduction and the averted loss of $399,520. Consequently, we estimated that the pilot generated a net gain of $387,663 from February 2019 through January 2020.

3.5.2 Forecasts

Even though the pilot ended about 14 months after launch, the solution is expected to have impacts into the future. We made several assumptions about the rate of adoption of the

[12] The profit of each additional card is $21.5, equal to the difference between the value of the card, $25, and the cost of the online credential $3.5. Selling 552 additional cards will cover all the profit reduction.

solution, the growth rate of salaries, and the discount rate to forecast the NPV of the solution impacts for the 5 years starting February 2020 through January 2025. The details of the calculations and the assumptions used are reported in Appendix C. Assuming a 7% discount rate and that all Resident ID Cards will be sold online starting February 2022,[13] we estimated that the number of staff hours saved by using the solution will be 9,809 hours, the NPV of which is $155,923 using staff salaries.

We also estimated the NPV of the difference in profits accruing to the TP Golf Course from the sale of Resident ID Cards, both in person and online, using the assumptions mentioned above, in addition to the value of the digital credential ($3.5) and the purchase price of the card ($25). The NPV of the difference in profits for the 5 years between February 2020 and January 2025 is a reduction of $297,388. Finally, the NPV of fraud prevented over this period is $1.991 million. The aggregate NPV of implementing the pilot solution from February 2020 through January 2025 is therefore $1.693 million. The total NPV of the pilot from February 2019 through January 2025 (first year of pilot operation + 5-year forecast) is $2.1 million. Over the same time period, we also estimated total time savings for staff to be close to 10,000 hours .

[13] This assumption was made after the COVID-19 pandemic, which prompted SD residents to increasingly purchase their Resident ID Cards online (around 85% and 88% of cards sold were purchased online in 2020 and 2021, respectively).

4. User Survey Results

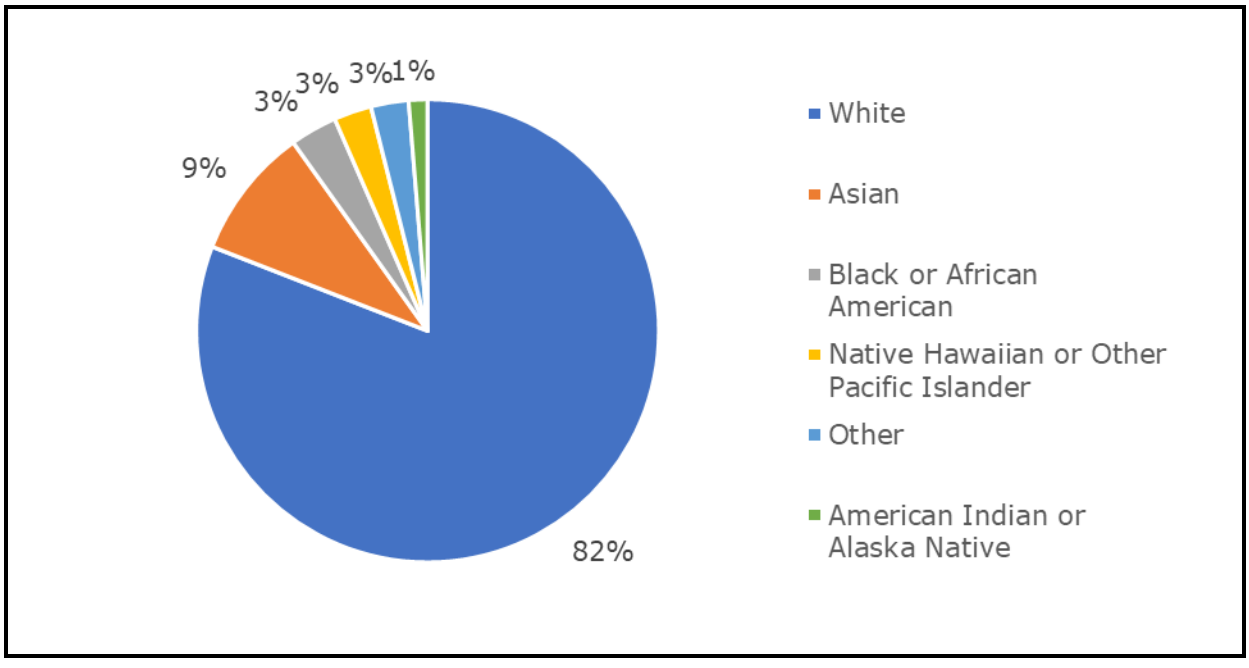
Most of those who renewed their Resident ID Card online provided positive survey feedback about the user experience. The average willingness-to-pay for the ability to renew a Resident ID Card online was an additional $5.50 on top of the current $25 fee. Survey results indicate nearly unanimous agreement among those who have or plan to renew online about the importance of their online security and privacy with slight hesitation about the ID.me identity verification process centering around needing to provide one's SSN.

Survey results indicate a strong willingness to use the online renewal system potentially hindered by barriers to adoption. Respondents were twice as likely to indicate that they planned to renew their Resident ID Card online than that they had already done so. In addition, over 30% of respondents who did or planned to renew in-person were unaware of or did not understand how to renew online.

4.1 Survey Respondent Characteristics

Between February 11 and May 6, 2020, there were 168 complete responses to the SD Golf Division user survey. Survey respondents were predominantly male (93%) and white (82%), with an average age of 60 years (range of 23 to 85 years). Figure 4.1 shows the breakdown of the ethnic and racial identities of survey respondents. About 9% of survey respondents identified as Asian, 3% identified as Black or African American, and 3% identified at Native Hawaiian or Other Pacific Islander. In a separate question, about 8% of survey respondents reported being of Hispanic, Latino, or Spanish origin or descent.

Figure 4.1. Survey Respondent Race/Ethnicity (*N* = 150)



4.2 Perceptions about Security and Privacy

RTI asked all survey respondents who reported that they either had renewed or were planning to renew their Resident ID Card online about their perceptions of the security and privacy enhancement features of the online renewal process. The results of these questions are summarized in Table 4.1. Unsurprisingly, most of these respondents indicated that they appreciated SD offering the choice to renew Resident ID Cards online (87% "agree" or "strongly agree").

Agreement about the importance of online security and privacy was higher than perceptions about the level of security or privacy offered through the Resident ID Card online renewal process. Nearly all respondents (96%) either agreed or strongly agreed that their online security was important to them. However, only 80% agreed or strongly agreed that they felt, or would feel, secure renewing their Resident ID Card online. Similarly, 95% of respondents agreed or strongly agreed that their online privacy was important to them, while only 71% agreed or strongly agreed that their privacy was, or would be, protected while renewing their Resident ID Card online. Based on open-ended responses provided throughout the survey, the lower perceptions about the privacy features of the online renewal process might be linked to the fact that users are asked to provide their SSN for ID.me to carry out the identity proofing process. Several survey respondents wrote that they were uncomfortable providing that level of personal information for the purpose of renewing a Resident ID Card.

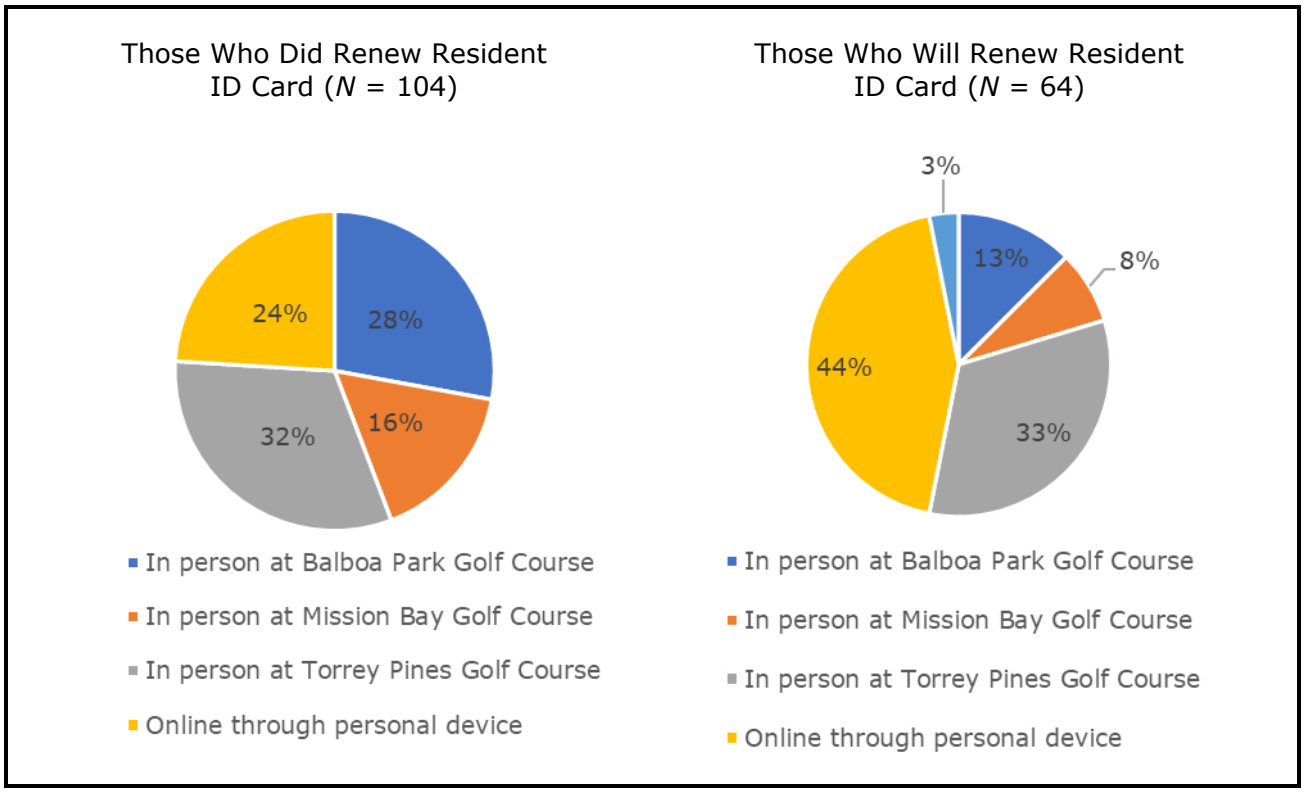
Table 4.1. Level to Which Survey Respondents Agree with the Above Statements

	Percent, %					
	Strongly Disagree	**Disagree**	**Neither Agree nor Disagree**	**Agree**	**Strongly Agree**	***Obs***
My online security is important to me	4	0	0	24	72	*54*
My online privacy is important to me	2	0	4	27	67	*55*
I appreciate that the City of San Diego is offering residents the choice to renew Resident ID Cards online	2	4	7	31	56	*54*
I felt/feel secure renewing my Resident ID Card online	4	0	16	44	36	*55*
I felt/feel that my privacy was/will be protected while renewing my Resident ID Card online	4	4	22	40	31	*55*

4.3 User Experience

At the time of the survey (between February and May 2020), about 62% of survey respondents reported renewing their Resident ID Card since March 2019 when online renewals first became available. Of those who had renewed their Resident ID Card, about a quarter (24%) had done so online (see Figure 4.2.). A much higher proportion of those who had not yet renewed their Resident ID Card indicated that they would like to do so online either through their personal device (44%) or at the kiosk located at TP (3%).[14]

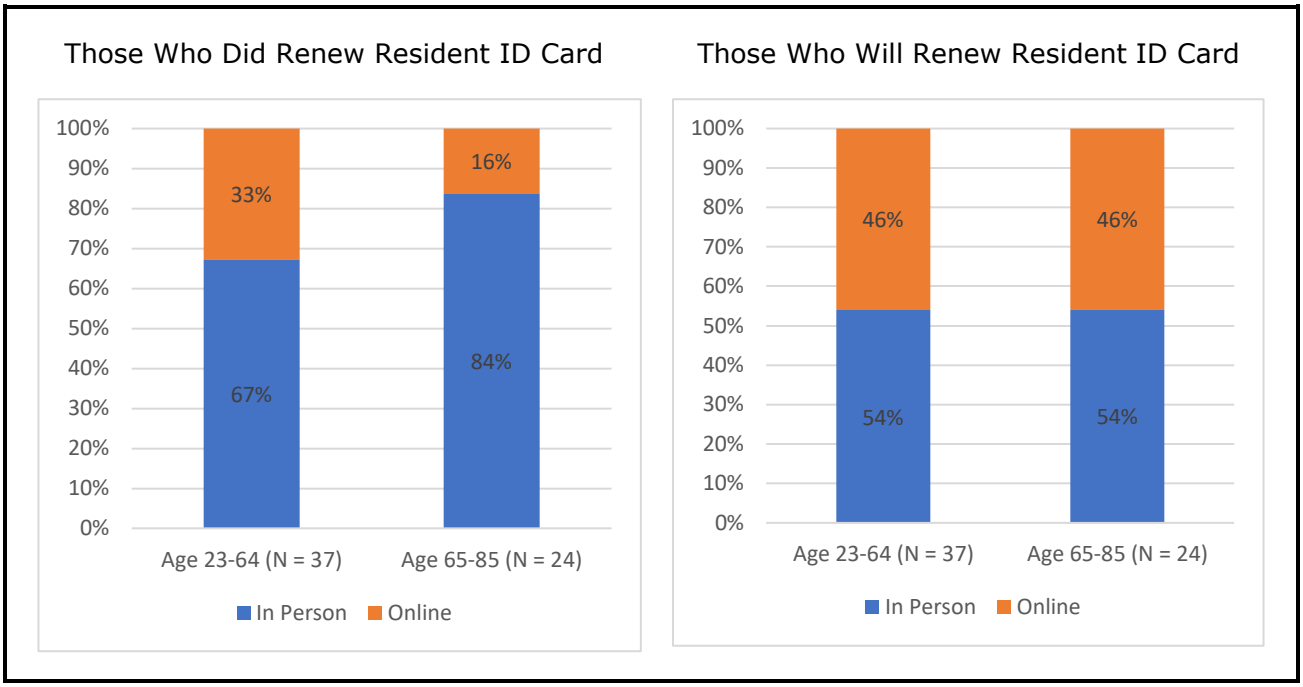
Figure 4.2. (Planned) Method of Renewing Resident ID Card



Among respondents who had already renewed their Resident ID Card, those aged 65 years and over were about half as likely as younger respondents to report having done so online (see Figure 4.3). However, those aged 65 years and over who had not yet renewed their Resident ID Cards were equally as likely as younger respondents to indicate that they planned to renew online. Thus, while it appears that there may be some barriers to early adoption of the online Resident ID Card verification process among older SD Golf District members, willingness to adopt does not appear to be one of them.

[14] Note that the kiosk was not available to use at the time of the survey. Hence, no respondents who had already renewed their Resident ID Card indicated having done so through the kiosk.

Figure 4.3. (Planned) Method of Renewing Resident ID Card by Age Group



4.3.1 Reasons for Choosing Renewal Method

Respondents who did (*N* = 25) or planned to (*N* = 30) renew their Resident ID Card online provided similar motivations for doing so or planning to do so. RTI presented survey respondents with several options for why they chose to or planned to renew online (see Figure 4.4). Most reported thinking it would be easier or more convenient than renewing in person, while 40% reported thinking it would be faster. Six respondents who had already renewed wrote in other reasons for renewing online that suggested they were in the process of trying to book tee times online but were prompted that they had to renew their Resident ID Card and were presented with the option to do so online. Six respondents who had not renewed yet indicated that they thought renewing online would be more secure or private. None indicated that they were unable or thought they would be unable to successfully renew in person due to a lack of proper documentation.

Respondents who had (*N* = 79) or planned to (*N* = 34) renew their Resident ID Card in person also provided similar reasons for doing so or planning to do so (see Figure 4.5). About 32% of respondents reported either not being aware of the ability to renew online or not understanding how to renew online. About 18 to 20% of respondents reported thinking it would be easier or more convenient to renew in person rather than online. Fourteen respondents total reported not being able to or not thinking they would be able to renew their ID online. Ten respondents total reported thinking it would be more private or secure than renewing online, and eight reported thinking it would be faster.

Figure 4.4. Reasons Provided for Renewing or Planning to Renew Resident ID Card Online

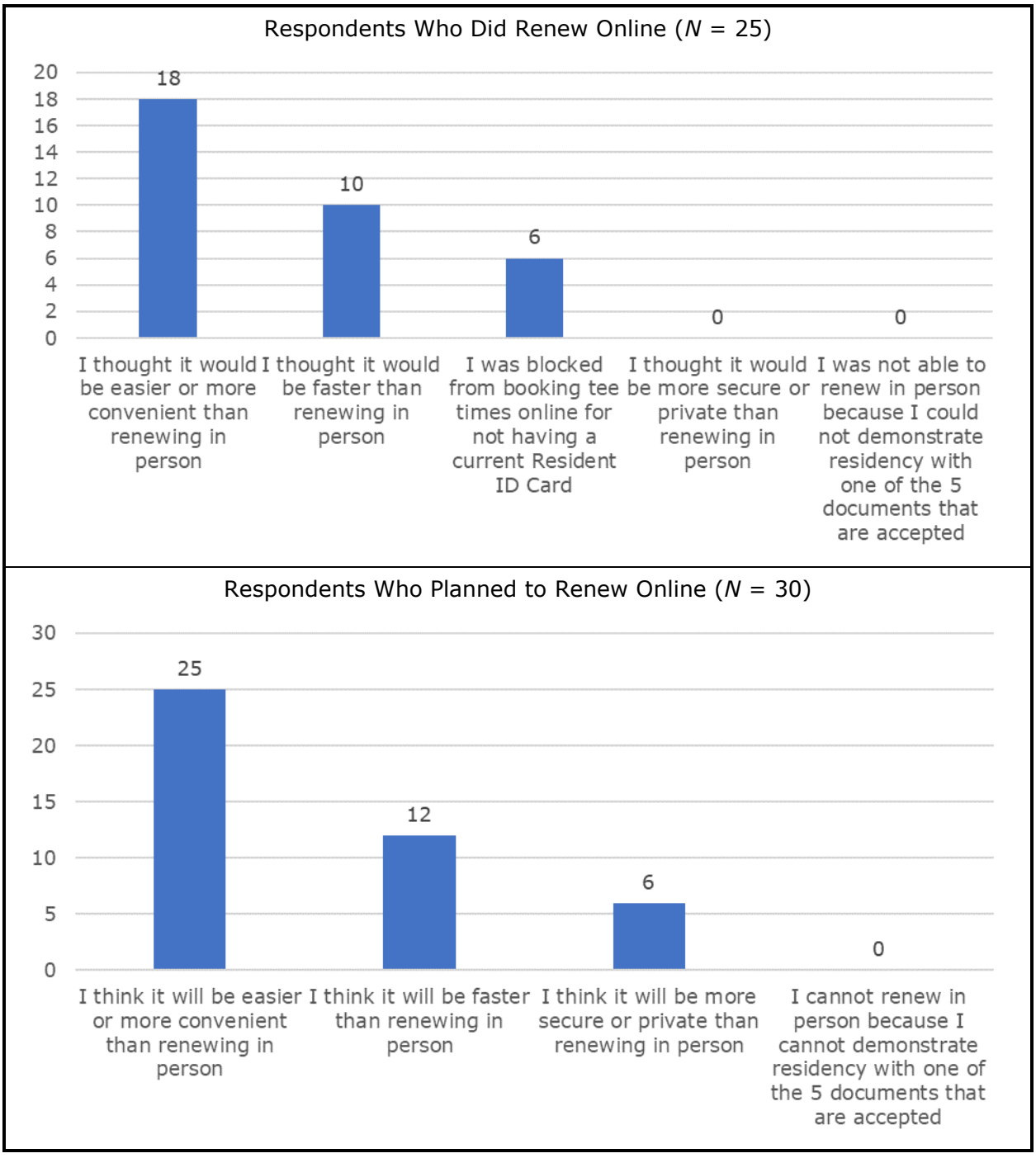
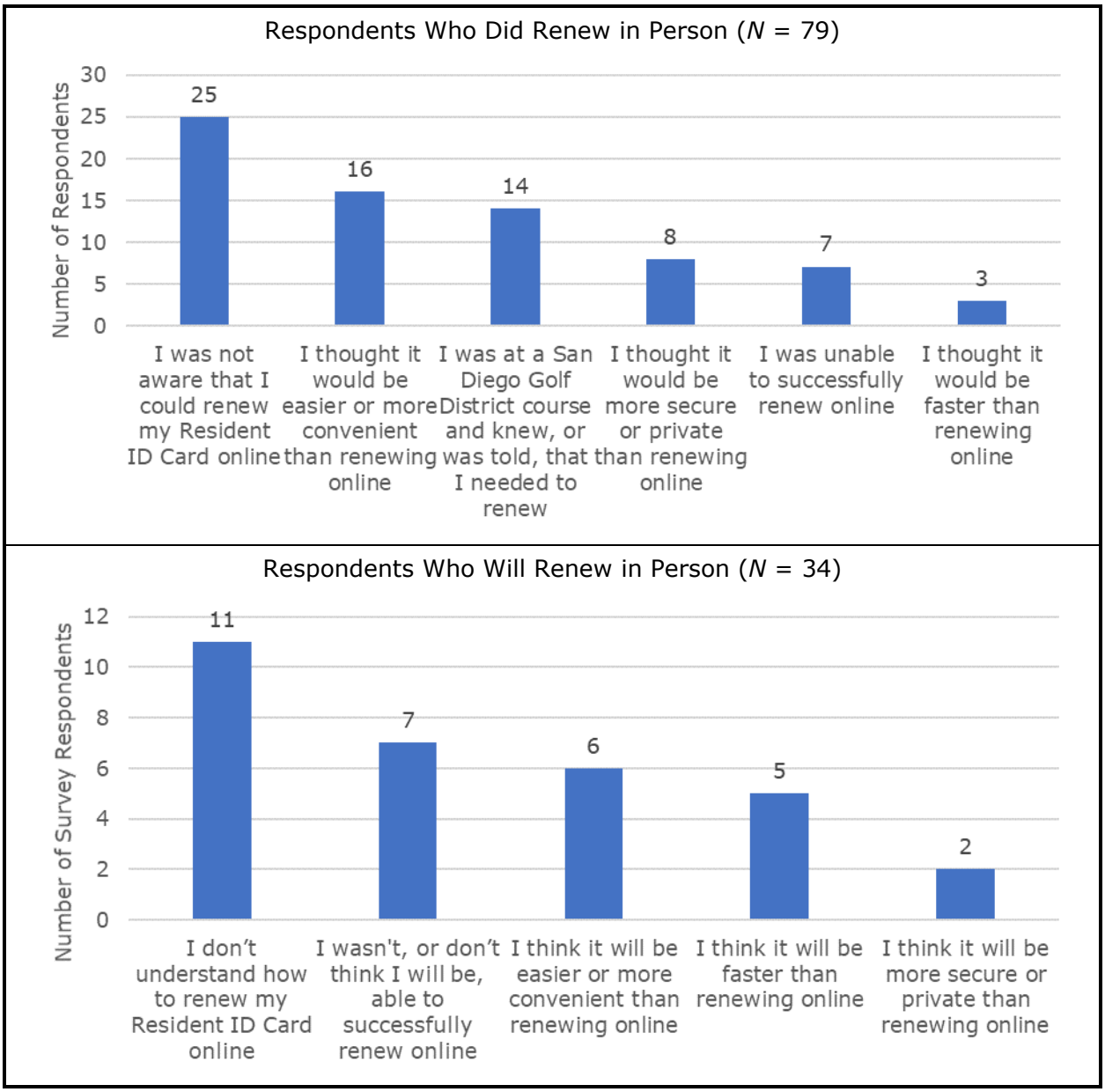


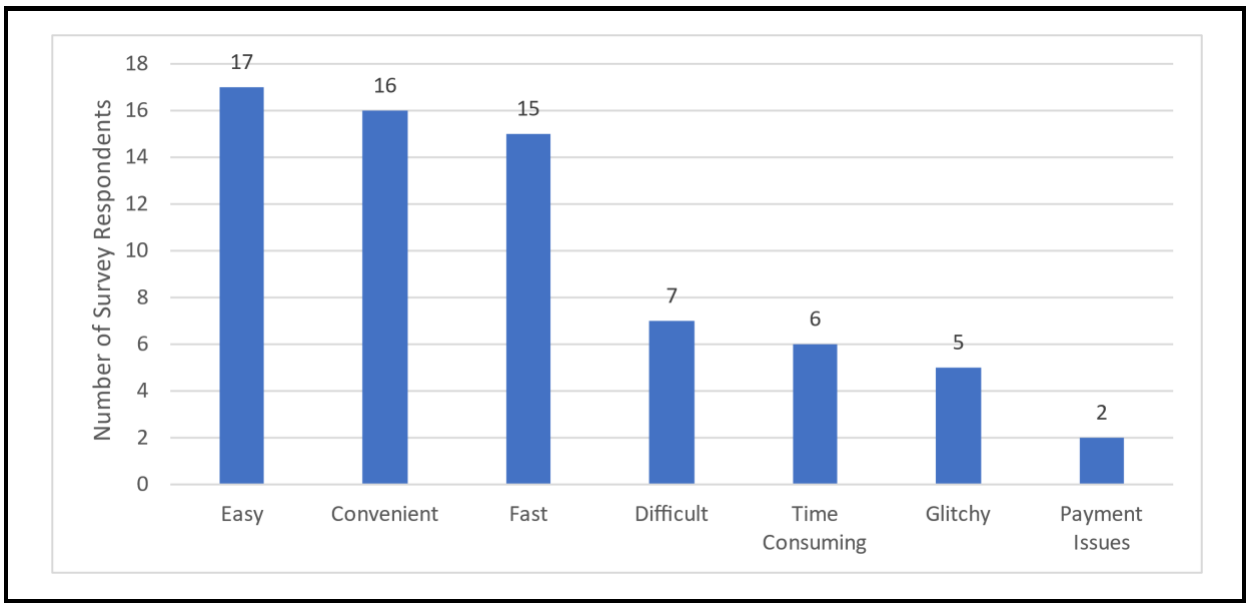
Figure 4.5. Reasons Provided for Renewing or Planning to Renew Resident ID Card in Person



4.3.2 Perceptions about and Willingness to Pay for Online Renewal

RTI also presented those who had renewed their Resident ID Card online (*N* = 25) with several options for describing the online renewal process (see Figure 4.6). Most described the online renewal process as "easy" (17), "convenient" (16), or "fast" (15). However, several did indicate experiencing technical issues, describing the process as "difficult" (7), "time consuming" (6), or "glitchy" (5). Two respondents indicated experiencing payment issues: one reported being unable to process their payment, and the other reported being charged twice. These issues are described in greater detail in Section 7.

Figure 4.6. Description of the Online Renewal Process Among Survey Respondents Who Had Renewed their Resident ID Card Online at the Time of the Survey (*N* = 25)



RTI asked both those who had renewed and those who planned to renew their Resident ID Card online about their willingness to pay for the opportunity to renew online rather than in person. Specifically, we asked respondents the following question:

> *To the nearest dollar amount, how much more would you be willing to pay to renew your Resident ID Card online rather than in person? Note that it currently costs $25 to renew your Resident ID Card both in person and online.*

Of the 54 respondents who answered the question, about 28% said they would be willing to pay more to renew online (see Table 4.2). The average willingness to pay among those respondents was $19.73. Including the $0 responses of those who were not willing to pay more brings the overall average willingness to pay to $5.48.

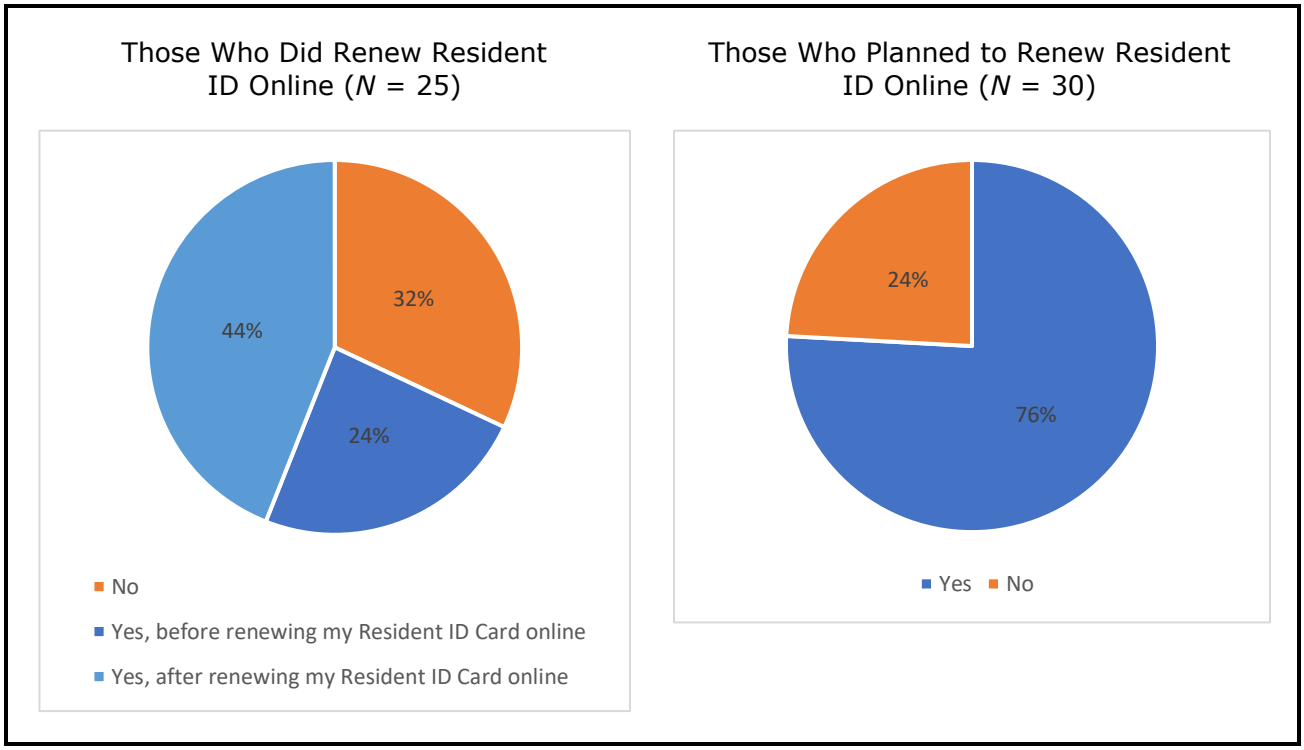
Table 4.2. Summary Statistics of the Willingness to Pay to Renew Resident ID Card Online Rather than in Person Among Respondents Who Did or Who Planned to Renew Online

	Mean	Min	Max	*Obs.*
Full sample	$5.48	$0	$75	*54*
Positive responses only	$19.73	$1	$75	*15*

4.3.3 Respondents' Other Online Transactions

To explore the connection between users' willingness to carry out various transactions online with the SD Golf Division, RTI asked respondents about booking tee times online. Among respondents who had already renewed their Resident ID Cards online, 24% had previously booked tee times online, and 44% booked tee times online after renewing their Resident ID Card online (Figure 4.7). Similarly, 76% of respondents who planned to renew their Resident ID Card online had already booked tee times online. Together, these results indicate that those who conduct one type of online transaction with the golf district are more likely to conduct other types of online transactions.

Figure 4.7. Respondents Indicating that They Had or Planned to Book Tee Times Online for the SD Golf Division



4.3.4 Use of ID.me Account

ID.me is an online platform that provides verification services for identity and group affiliation (teachers, first responders, students, military personnel, and others) across several websites. Therefore, individuals could use their ID.me account for more than one purpose. About 28% of the survey respondents who had already renewed their Resident ID Card online (N = 25) reported having used their ID.me account elsewhere. It is not clear if this indicates a lack of awareness about the ability to use ID.me credentials for other online transactions, a lack of interest in doing so, or a lack of opportunity to do so.

5. Privacy and Security Impacts

ID.me listed increased security and fraud reduction as benefits of the identity proofing solution offered at TP. Specifically, the goal was to decrease the likelihood that a Resident ID Card could be purchased fraudulently through one of the SD golf courses. By way of example, previous successful fraudulent attempts included the residential movement of a person from SD to another locality without updating their driver's license to reflect their new residence.

The ID.me solution provided several privacy- and security-related functions for TP:

- Proofed residents at the LOA 3 level, which included multifactor authentication
- Removed the burden of identity proofing from golf course staff
- Removed the potential for fraudulent residency claims
- Minimized the risk of potential human error in processing claims, thereby potentially reducing the frequency of approval of false claims
- ID.me is a Federal Identity, Credential, and Access Management credential service provider for the federal government, which lends credibility to the security and privacy controls of the service authenticating residency for the population of SD

ID.me completed a PRAM evaluation of privacy-implicated risk for the pilot, which was submitted to the National Institute of Standards and Technology (NIST). Neither Kuma nor RTI were provided an opportunity to review the PRAM. As noted in Section 2.3, limitations on the documentation available for evaluating the privacy and/or security implications of any of the NSTIC State Pilots prevent us from either confirming or refuting risks alongside any mitigating or reductive effects of the pilot technology or solution.

Of note, TP did receive some negative press during the pilot regarding the proofing solution. The press included an interview with a disgruntled community member, who made claims about the insecurity of the proofing process. Ultimately, the claims were unjustified and did not pose a significant barrier to adoption.

Overwhelmingly, the expansion of the ID.me credential service to identity proof SD residents was perceived by both community members and golf course stakeholders as a vehicle to improve both security and privacy and to reduce fraud. Notably, golf course staff were equally pleased that they no longer needed to verify residents' identities. This responsibility had become a particular sore spot for the organization, and friction could arise between the golf course and a fraudster if a challenge was made to the residency claim. TP staff noted several times that mitigating this role in the process was one of the solution's positive impacts.

6. Qualitative Findings

This section presents the qualitative findings about the ID.me pilot solution. We elicited insights and perspectives about pilot outcomes in interviews with Mr. Michael Jones, Golf Course Manager at TP, and representatives from the SD Parks and Recreation Department. Below, we discuss the pilot's strengths and success factors, the impact of the NIST grant, and the potential for scaling the pilot.

6.1 Pilot Strengths

The interviews we conducted highlighted that the pilot was successful in attaining its targeted goals in addition to unexpected benefits realized during the COVID-19 pandemic. The pilot was successful in achieving the benefits discussed below.

6.1.1 Efficiency

The solution enhanced efficiency by taking over one of the most time-intensive tasks performed by staff, especially relative to the revenue generated, namely processing Resident ID Cards. Another advantage of the pilot was removing the need for on-site staff to handle sensitive information and personal documents required to prove residence. There was a strong preference for golf course staff to not have to conduct ID proofing and residence verification, which is not part of their standard job duties. Having these tasks completed by a specialized entity like ID.me thus resulted in time and convenience savings for staff.

6.1.2 Enhanced User Experience

The majority of residents Mr. Jones spoke with about the pilot provided positive feedback regarding the convenience of being able to complete the process online. ID.me is working with its marketing team on an extensive, updated user guide to help SD residents self-serve in the online flow. This guide will help all users understand who ID.me is and how the flow works and continue to minimize the number of users who require in-person assistance.

6.1.3 Cross-Agency Platform

ID.me provides an identity solution by establishing a digital wallet, called ID.me Wallet, in which a user stores all their digital ID cards and accesses them using a Single Sign On. This allows users, once they have had their identity verified, to use their credentials across different agencies where ID.me is used. Many of the SD residents that have purchased a Resident ID Card for use in TP had already had their identity verified previously by ID.me through another agency:

- 927 had an ID.me account through the State of California DMV, which is using another ID.me pilot funded by a NIST grant
- 72 had been verified through VA.gov
- 192 had an account through SeaWorld (veteran discount)
- 554 additional residents had an account through some combination of 115 other organizations where ID.me is an option

6.1.4 Benefits during the COVID-19 Pandemic

The greatest success of the pilot was successfully instituting an online process that verified an individual's identity and residency within the city limits. This proved to be a crucial development for the city because SD was able to successfully switch from an 80% in-person, 20% online model that had been instituted during the pilot to a 95% online solution that keeps customers and city workers protected, as well as allowing SD to maintain consistent resident services and benefits when in-person interactions had to be limited during the COVID-19 pandemic. Feedback from the TP stakeholders indicated that during the pandemic, available staff was reduced while there was a concurrent increase in utilization at the facilities. The reduced staff were able to handle the increased volume because of the ID.me pilot, which provided TP visitors with the means to safely and conveniently verify residency and purchase Resident ID Cards online. SD saw 15,830 online transactions from March 15, 2020, to July 22, 2020, a 658% increase from the same time frame the previous year.

6.2 Pilot Success Factors

According to the ID.me team and Mr. Jones, one of the main drivers for the pilot's success was comprehensive preparation and planning. ID.me spoke with SD at length to discuss their needs. Understanding the user personas, the identified pain points, and the process the city was trying to solve for was crucial in developing a lasting solution that could withstand massive increases in demand. ID.me was also responsive to the needs of SD in terms of pilot implementation and sought to verify that there were no breaks in the process. In addition, Mr. Jones noted the value of the dedication of the ID.me and foreUP teams to making the process a success. The high levels of responsiveness and communication between the teams helped address integration issues as they arose.

6.3 Impact of the NIST Grant

NIST's grant funding played a significant role in SD's decision to adopt the ID.me pilot. It provided SD with an opportunity to use advanced technology to achieve its goals at no cost. Despite the typical, lengthy contractual process, the presence of NIST as a reliable source of funding helped create a robust, content-rich contract and facilitated the process. Moreover,

the presence of NIST as the funding source had a positive qualitative effect on discussions with stakeholders leading up to the pilot's implementation by helping to establish credibility.

Even though a similar proofing process would have eventually been set up to achieve the goals set forth by SD, Mr. Jones believes this would not have happened as quickly or as smoothly without the presence of NIST. He indicated that the time duration of the grant was sufficient for the pilot implementation and that NIST's flexibility in approving extensions was helpful in allowing the pilot to meet SD's goals.

6.4 Scalability

SD is exploring options to implement the ID.me pilot solution in additional agencies where identity proofing and residence verification are needed. For example, park district representatives suggested that it would be useful to have an automated solution to facilitate registration for classes and activities. SD residents are waived from paying registration fees but must prove residency in person every time they register for an offering because the park district does not keep any records of residency status on file. Families at lower income levels also qualify for tuition waivers but again must show proof of income to park district staff for every registration. The in-person residency and income verification process puts staff in the uncomfortable position of viewing residents' personal information and creates inconvenience for residents and potential shaming for low-income residents. ID.me developed an income verification process to facilitate identifying residents who are eligible for fee or tuition waivers and are working with SD to combine it with the current residency verification process. They plan to launch this feature in the summer of 2021.

If online payment could be incorporated through another vendor, the entire park district programs registration process could be moved online. Park district representatives thought moving processes online would save roughly 15 minutes of staff time per registration and that time could be reallocated to program enhancements. TP and park district representatives felt that other SD agencies could also potentially benefit from implementing the ID.me solution, including the library, fire department, and environmental services department. They noted that the contract process for additional adopting agencies would be easier because of the contract put in place by TP. Broader adoption would also decrease the per-person verification costs charged by ID.me for their services.

Features that help with the scalability of the ID.me solution are the presence of a web interface and the presence of an API functionality that can be integrated into any kind of software. Impediments to scalability are restrictive regulations and local government's tendency to be slow to adopt new technology solutions.

7. Pilot Challenges and Lessons Learned

The pilot encountered several challenges throughout the implementation process that required the ID.me pilot team to adapt and learn to ensure continued success. Lessons learned were gathered from interviews with pilot stakeholders and from questionnaires provided to ID.me pilot staff. Below we discuss some of these challenges and the lessons learned by the pilot team to provide guidance to future pilots implementing improved identity solutions.

7.1 Defining and Measuring Success

ID.me identified the importance of clarifying with all parties involved the criteria for successfully implementing the pilot. Once these criteria have been established, it is equally important to track data and metrics that will measure the extent to which the pilot solution has achieved the targeted goals. It is important to start data collection before pilot implementation to establish a baseline to compare to pilot outcomes. Data collection should continue during and after pilot implementation to better track the outcomes of the pilot over time. For example, for this pilot, TP tracked the number of Resident ID Cards sold each month well before the pilot was implemented and then tracked the monthly number of cards sold online and in person after the solution was launched. These data provided quantitative indicators of how users responded to the pilot.

7.2 Addressing Challenging Resident Verifications

The ID.me pilot solution has had difficulty handling "corner cases," or instances where residency verification is not straightforward. For example, there have been some difficulties with completing online residency verification for students who attend SD schools or military personnel who are stationed in SD because these individuals are granted Resident ID Cards even if they do not reside in the city.

It is also difficult to identify some false positives, or cases where ineligible individuals have been erroneously accepted as SD residents. For example, some individuals have their business address on their driver's license for the sole purpose of obtaining the Resident ID Card. The ID.me pilot needs to capture these cases. TP management tested the ID.me solution by having staff members who do not live in the city and who are therefore not eligible to obtain a Resident ID Card try and purchase a card. Some were denied, but one staff member was accepted. This test case helped troubleshoot the solution to prevent similar cases from occurring. A lesson learned from this experience is that it is more efficient to verify at the outset that an identity solution is properly designed to flag false positives and keep ineligible individuals from being accepted as ID proofed than it is to fix errors in the solution identified later on.

7.3 Working with Third-Party Vendors

The integration of the point-of-sale (POS) system by foreUP, a third-party vendor, has faced technical hurdles, impeding the full implementation of the pilot. Some individuals have successfully gone through the identity proofing process online but have been unable to purchase their Resident ID Card.

One lesson learned by ID.me throughout this process was the need to establish robust communication with third-party vendors early on, along with a system for holding these parties accountable for their roles in ensuring the pilot's success. ID.me also identified the need to better anticipate potential implementation issues and to develop contingencies for setbacks if they occur.

Also, because staff will most likely receive calls from individuals inquiring about different issues, including high-level technical questions, ID.me noted that it is important to educate staff about the details of the solution so that they can direct their calls to the appropriate party. For example, they would need to know which issues need directing to ID.me and which require help from foreUP.

7.4 Integrating NextGenID Kiosk

The third-party integration issues discussed above also hampered the ability to use a kiosk that would facilitate in-person Resident ID Card proofing and purchase. Standing up the kiosk required integration not only between ID.me and foreUP but also with NextGen to ensure that both systems worked effectively with the kiosk software. For example, the workability of the kiosk was hindered because the kiosk featured a proprietary web browser that was not compatible with all the features and capabilities inherent in the ID.me solution technology. ID.me was also unable to have access to a fully functional staging environment for the kiosk to effectively develop, test, and deploy their solution.

These integration issues resulted in the kiosk never being successfully used by the time of this publication. In addition, the kiosk had an extremely large physical footprint that took up an inefficient amount of space in the small office available to TP staff. All of these factors led the ID.me and TP pilot team to conclude that it was no longer cost-effective to invest in trying to use the kiosk. Instead, ID.me shifted their focus to making iPad-based solutions that TP patrons could use to complete in-person Resident ID Card proofing. This proved to be much more cost-effective and practical for the small-scale need of the golf course.

8. Conclusion

In this report, we assessed the impacts of the ID.me TP pilot. The goals of the pilot were to increase convenience and security and improve fraud prevention. We evaluated the quantitative and qualitative impacts of the pilot by collecting pilot performance metrics, conducting stakeholder interviews and surveys among pilot users, and soliciting details from TP and ID.me staff about the privacy and security features of the pilot.

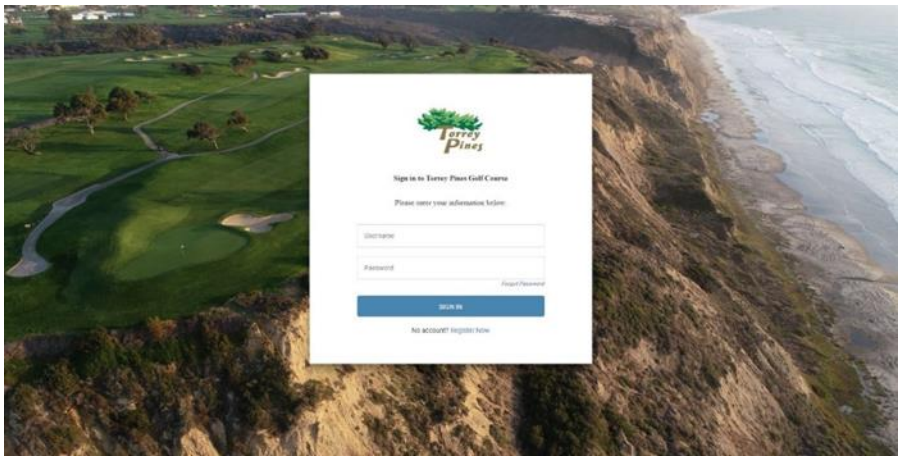
We found that the pilot had significant positive impacts pertaining to time and cost savings, user convenience, agency efficiency, and privacy and security. We estimated that the implementation of the ID.me pilot solution led during its first year of operation to fraud prevention savings of almost $400,000. We also forecasted the impact of the pilot for 5 more years and estimated the total net present value (NPV) of the pilot from February 2019 through January 2025 to be over $2 million. Qualitatively, we found that the solution provided convenience for users and increased resilience during the COVID-19 pandemic since it allowed for online identity and residence verification and Resident ID Card purchases.

An important benefit of the pilot is that it was the first such solution in SD and its success provided motivation for SD officials to consider expanding the ID.me platform to other agencies where identity and/or residence need to be verified. Since ID.me also provides identity proofing services to the State of California DMV, ID.me credentials could be leveraged across multiple agencies and potentially be applied as a state-wide solution. This would lead to efficiency and cost savings in addition to much improved user experience.

Appendix A:
TP User Survey Instrument and Messaging

A.1 Survey Messaging from City of San Diego Golf Division February 2020 e-Newsletter

City of San Diego Golf Division | February 2020



Renewed your Resident Card Online? We Want Your Feedback

RTI International – a nonprofit research organization – is conducting a 5-minute survey among San Diego Golf Division users to gather feedback on the Resident ID Card renewal experience. Your participation in RTI's survey will be an invaluable part of evaluating the impacts of the pilot.

The survey can be accessed at this link and will run until March 20th.

Your survey feedback is completely voluntary and will be kept confidential.

If you have questions about the survey, please reach out to the RTI survey coordinator, Marwa Salem, via email at ******@rti.org or by phone at (***) ***-****.

Take the Survey

A.2 Survey Reminder Messaging from SD Golf Division April 2020 e-Newsletter

We Want to Hear About Your Resident I.D. Card Online Experience

Please find a friendly reminder to take the survey previously announced in the February newsletter regarding the automation of the proofing process for the City of San Diego.

We are working with ID.me to automate the proofing process for the City of San Diego Resident ID Card program. Our goal is to improve the customer experience by offering a more convenient and secure method of verifying residency that also increases the level of confidence in the credential itself.

A National Institute of Standards and Technology (NIST) grant awarded to ID.me allows the City of San Diego to work with ID.me to pilot a solution that is more operationally efficient and more convenient for the end user. 2020 will begin the second year of this pilot, and the City's Parks and Recreation department looks forward to continued refinement in the program while working with ID.me.

NIST contracted RTI International – a nonprofit research organization – to evaluate ID.me's pilot with the City of San Diego. In support of the evaluation, RTI is conducting a 5-minute survey among San Diego Golf Division users to gather feedback on the Resident ID Card renewal experience. Your participation in RTI's survey will be an invaluable part of evaluating the impacts of the pilot.

The survey can be accessed at this link and will run until April 30th.

Your survey feedback is completely voluntary and will be kept confidential – results will be reported in aggregate without any identifying information.

If you have questions about the survey, please reach out to the RTI survey coordinator, Marwa Salem, via email at ******@rti.org or by phone at (***) ***-****.

A.3 Survey Instrument from SurveyGizmo

City of San Diego Resident ID Card Survey

Thank you for providing feedback on your experiences with renewing your City of San Diego Resident ID Card for use in the City of San Diego Golf Division. The Golf Division is working with ID.me to automate the proofing process for its Resident ID Card program. A National Institute of Standards and Technology (NIST) grant awarded to ID.me has allowed the City of San Diego to work with ID.me to pilot a residency verification process that is more convenient and secure for users and also increases the level of confidence in the credential itself.

NIST contracted RTI International – a nonprofit research organization – to evaluate ID.me's pilot with the City of San Diego. The feedback you provide through RTI's survey will be an invaluable part of evaluating the impacts of the pilot. Your survey feedback is completely voluntary **and will be kept confidential – results will be reported in aggregate without any identifying information. If you have questions about the survey, please reach out to the RTI survey coordinator, Marwa Salem, via email at ******@rti.org or by phone at (***) ***-****.**

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1) Have you renewed your City of San Diego Resident ID Card since March of 2019?*

( ) Yes
( ) No

2) How did you renew your Resident ID Card?*

( ) In person at Torrey Pines Golf Course
( ) In person at Balboa Park Golf Course
( ) In person at Mission Bay Golf Course
( ) Online through my personal device
( ) Online through the kiosk located at Torrey Pines Golf Course

3) When you next renew your Resident ID Card, how do you plan to do it?*

( ) In person at Torrey Pines Golf Course
( ) In person at Balboa Park Golf Course
( ) In person at Mission Bay Golf Course
( ) Online through my personal device
( ) Online through the kiosk located at Torrey Pines Golf Course

4) Why did you decide to renew your Resident ID Card online? Please select all that apply.

( ) I thought it would be easier or more convenient than renewing in person

( ) I thought it would be faster than renewing in person

( ) I thought it would be more secure or private than renewing in person

( ) I was not able to renew in person because I could not demonstrate residency with one of the 5 documents that are accepted (Permanent California driver's license, California automobile registration, Property tax bill, Active duty military ID card – stationed in San Diego, or Current student ID card from a city of San Diego high school or college with official class schedule)

( ) Other reason (please specify): _____

5) Why will you renew your Resident ID Card online? Please select all that apply.

( ) I think it will be easier or more convenient than renewing in person

( ) I think it will be faster than renewing in person

( ) I think it will be more secure or private than renewing in person

( ) I cannot renew in person because I cannot demonstrate residency with one of the 5 documents that are accepted (Permanent California driver's license, California automobile registration, Property tax bill, Active duty military ID card – stationed in San Diego, or Current student ID card from a city of San Diego high school or college with official class schedule)

( ) Other reason (please specify): _____

6) How would you describe the process of renewing your Resident ID Card online? Please select all that apply:

( ) Easy

( ) Convenient

( ) Fast

( ) Difficult

( ) Time Consuming

( ) Glitchy

( ) Could Not Process Payment

( ) Other (Please Specify): _____

7) Please indicate the level to which you agree with the following statements:

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
My online security is important to me	( )	( )	( )	( )	( )
My online privacy is important to me	( )	( )	( )	( )	( )
I felt secure renewing my Resident ID Card online	( )	( )	( )	( )	( )
I feel secure renewing my Resident ID Card online	( )	( )	( )	( )	( )
I felt that my privacy was protected while renewing my Resident ID Card online	( )	( )	( )	( )	( )
I feel that my privacy will be protected while renewing my Resident ID Card online	( )	( )	( )	( )	( )
I appreciate that the City of San Diego is offering residents the choice to renew Resident ID Cards online	( )	( )	( )	( )	( )

8) Have you booked tee times online for the City of San Diego Golf division (at SanDiego.gov/golf)?

( ) Yes, before renewing my Resident ID Card online
( ) Yes, after renewing my Resident ID Card online
( ) No

9) Have you booked tee times online for the City of San Diego Golf division (at SanDiego.gov/golf)?

( ) Yes
( ) No

10) Did renewing your Resident ID Card online increase your confidence in and/or awareness about booking tee times online?

( ) Yes, it increased both my confidence in and awareness about online booking.
( ) Yes, it increased my confidence in online booking.
( ) Yes, it increased my awareness about online booking.
( ) No, I don't think it influenced my choice to book tee times online.

11) Did booking tee times online increase your confidence in and/or awareness about renewing your Resident ID Card online?

( ) Yes, it increased both my confidence in and awareness about renewing my Resident ID Card online.
( ) Yes, it increased my confidence in renewing my Resident ID Card online.
( ) Yes, it increased my awareness about renewing my Resident ID Card online.
( ) No, I don't think it influenced my choice to renew my Resident ID Card online.

12) Have you used your ID.me account anywhere else since renewing your Resident ID Card online?

( ) Yes
( ) No

13) Why did you decide to renew your Resident ID Card in person? Please select all that apply.

( ) I was not aware that I could renew my Resident ID Card online
( ) I thought it would be easier or more convenient than renewing online
( ) I thought it would be faster than renewing online
( ) I thought it would be more secure or private than renewing online
( ) I was unable to successfully renew online
( ) Other reason (please specify): _____

14) Why did you renew your Resident ID Card at the golf course you selected?

( ) I renewed my Resident ID Card at the location that is most conveniently located for me
( ) I renewed my Resident ID Card at the location I golf at most frequently
( ) I renewed my Resident ID Card at the location where the staff seem the most friendly
( ) Other reason (please specify): _____

15) Why will you renew your Resident ID Card in person? Please select all that apply.

( ) I don't understand how to renew my Resident ID Card online
( ) I think it will be easier or more convenient than renewing online
( ) I think it will be faster than renewing online
( ) I think it will be more secure or private than renewing online
( ) I don't think I will be able to successfully renew online
( ) Other reason (please specify): _____

16) Why will you renew your Resident ID Card at the golf course you selected?

( ) I will renew my Resident ID Card at the location that is most conveniently located for me

( ) I will renew my Resident ID Card at the location I golf at most frequently

( ) I will renew my Resident ID Card at the location where the staff seem the most friendly

( ) Other reason (please specify): _____

17) Would you be willing to pay more money to renew your Resident ID Card online rather than in person?

( ) Yes

( ) No

18) To the nearest dollar amount, *how much more* would you be willing to pay to renew your Resident ID Card online rather than in person? Note that it currently costs $25 to renew your Resident ID Card both in person and online. _____

19) Is there anything else you would like to tell us about renewing your City of San Diego Resident ID Card online?

_____

_____

_____

_____

20) Is there anything else you would like to tell us about renewing your City of San Diego Resident ID Card?

_____

_____

_____

_____

21) What is your age? _____

22) What is your sex?

( ) Male

( ) Female

( ) Other

( ) Prefer Not to Say

23) Are you of Hispanic, Latino, or Spanish origin or descent?

( ) Yes
( ) No
( ) Prefer Not to Say

24) Which of the following groups best describes you? Please select all that apply.

( ) American Indian or Alaska Native
( ) Asian
( ) Black or African American
( ) Native Hawaiian or Other Pacific Islander
( ) White
( ) Prefer Not to Say
( ) Other (please specify): _____

25) Please provide some basic information to help the RTI survey team confirm that you are on the City of San Diego Golf Division email list. This information will be kept confidential within the RTI survey team and will not be publicly linked to your survey responses in any way.

First Name: _____

Last Name: _____

Email Address: _____

Thank You!

Thank you for taking our survey. Your response is very important to us.

Appendix B:
Stakeholder Interview Guide

Thank you for taking the time to speak with us about your participation in the ID.me pilot use case in the City of San Diego funded by NIST. RTI International, on behalf of NIST, is conducting an independent review and assessment of the pilot and your feedback is highly instrumental towards this effort.

We appreciate that your time is valuable. This interview should take no more than 1 hour.

Section 1: Background

1. In brief, please tell us about your agency's role in the San Diego pilot.
2. What were your agency's main objectives in implementing the San Diego pilot?
    a. What features of the San Diego pilot did you anticipate needing most?
3. (How) did NIST's funding of the pilot influence your decision to participate?

Section 2: Outcomes

4. Were your agency's main objectives addressed by the San Diego pilot? Please explain.
5. Were there any realized benefits of the pilot implementation that were not expected?
6. Were there any negative effects of the pilot implementation that were not expected?
7. Did you experience any cost savings by participating in the San Diego pilot compared to having your agency independently carry out the technology changes offered by pilot?
    a. If so, about how much (dollars and %)?
8. Do you think your agency would have been able to achieve the same outcomes independently as those achieved through the pilot? Please explain.

Section 3: User Feedback

9. Have you solicited feedback from users about their experience with the pilot? If so, please provide us with a high-level overview of their responses regarding:
    a. What they found most helpful
    b. What were their perceptions about added privacy, security, and/or convenience?
    c. What, if any, issues that they ran into while using the pilot

d. What additions or improvements they would like to be implemented

Section 4: Lessons Learned

10. What factors do you think contributed to the overall success of the San Diego pilot?
11. What areas of improvement remain to be addressed?
12. What are the main lessons learned when it comes to any potential pitfalls that similar future pilot implementations may run into?

Section 5: Scalability

13. Do you think the time duration of the grant was suitable for pilot implementation?
    a. Has the level of flexibility provided by NIST for the grant duration been sufficient to meet your needs? Please explain.
14. What features of the San Diego pilot technology do you think most contributed to the scalability of the technology across state agencies?
15. What, if any, issues do you think may have limited scalability? In other words, do you think the pilot technology could have been more widely implemented if certain aspects had been different?

Appendix C:
Forecast Assumptions

Table C-1. Assumptions About the Values of Staff Salaries, Credentials, Resident ID Cards, and the Discount Rate[a]

Variable	Assumption
Staff hourly rate in 2020	$18.50
Annual growth in staff hourly rate (%)	3%
Annual growth rate in number of cards sold (%) (Feb 2020-Jan 2022)	5%
Annual growth rate in number of cards sold (%) (Feb 2022-Jan 2025)	9%
Cost of a digital credential	$3.50
Price of a Resident ID Card	$25.00
Annual increase in price differential between residents and non-residents	1%
Discount rate	7%

[a] The discount rate is used to calculate the net present value (NPV) of future monetary values.

Table C-2. Assumptions About the Percentage of Cards Sold Online and the Percentage of Online Verifications Resulting in Purchase

	Percentage, %	
Year	Cards Sold Online	Online Verifications Resulting in Purchase
Year 1 (Feb 2020–Jan 2021)	85	75
Year 2 (Feb 2021–Jan 2022)	88	85
Year 3 (Feb 2022–Jan 2023)	100	100
Year 4 (Feb 2023–Jan 2024)	100	100
Year 5 (Feb 2024–Jan 2025)	100	100

Table C-3. Assumptions About the Time Necessary to Process Resident ID Cards Online and In-person

Type of Application Process	Time to Process (Minutes)
In person	4.5
Online	0.5

Table C-4. Assumptions About the Percentage of Resident ID Cards Sold Fraudulently and the Frequency of Golfing Among TP Visitors

Assumptions for Estimating Fraud Prevented (Lost Revenue)	
Percentage of cards sold to ineligible individuals	0.5%
Number of weekend days/month residents play (South Course)	0.75
Number of weekdays/month residents play (South Course)	0.25
Number of weekend days/month residents play (North Course)	0.75
Number of weekdays/month residents play (North Course)	0.25

Table C-5. Prices of Daily Golf Course Fees at TP

Assumptions for Estimating Fraud Prevented (Lost Revenue)	
Value of daily rate for residents (weekends) (South Course)[a]	$78.00
Value of daily rate for non-residents (weekends) (South Course)[a]	$252.00
Value of daily rate for residents (Mon-Thurs) (South Course) [a]	$63.00
Weighted average value of daily rate for residents (Mon-Thurs) (South Course)[b]	$58.32
Value of daily rate for non-residents (Mon-Thurs) (South Course)[a]	$202.00
Value of daily rate for residents (weekends) (North Course) [a]	$58.00
Value of daily rate for non-residents (weekends) (North Course) [a]	$160.00
Value of daily rate for residents (Mon-Thurs) (North Course)[a]	$44.00
Weighted average value of daily rate for residents (Mon-Thurs) (North Course)[b]	$41.04
Value of daily rate for non-residents (Mon-Thurs) (North Course)[a]	$128.00

[a] Numbers reflect fees for 18 holes.

[b] Numbers calculated as the weighted average of adults and seniors rates, where weights were the shares of each age group in the total of all adults and seniors. Where weighted averages are calculated, their numbers are used in calculating the pilot impacts, and not the non-averaged rates.

Source: https://www.sandiego.gov/park-and-recreation/golf/torreypines/reservations/fees