PRIORITY Criminal Justice NEEDS INITIATIVE

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Leveraging Technology to Support Prisoner Reentry

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EXECUTIVE SUMMARY

High recidivism rates among justice-involved individuals are a persistent challenge for the corrections sector, and this challenge incurs significant costs to these individuals, their victims, their communities, and the larger society. Therefore, preparing these individuals for successful reentry into the community and long-term desistance from crime is a critical mission of corrections agencies and their community-based partners. To accomplish this, corrections agencies and their partners typically employ a variety of supervision services and programs to address common need areas (e.g., vocational needs, educational needs, family reunification, substance use, mental health, housing), with a focus on the individual's criminogenic factors (i.e., factors associated with an increased likelihood of reoffending). The corrections sector is increasingly leveraging technology-based solutions to deliver and/or augment these services. This trend has been accelerated by the coronavirus disease 2019 (COVID-19) pandemic, which has forced agencies to lean heavily on technology to deliver a wide variety of treatment and supervision services remotely. Furthermore, corrections agencies and their partners are recognizing that returning citizens need access to technology at each stage of the reentry process; however, these agencies also need to minimize associated security risks. This is critical to both providing access to relevant programming content and helping individuals become familiar and proficient with the technology necessary to function in today's world.

Common barriers to using these technologies include cost, staffing requirements to implement technology solutions, scalability, and challenges associated with information-sharing and collaboration between public and private entities engaged in reentry. Furthermore, correctional institutions can be risk averse and might prioritize security above rehabilitative objectives. Naturally, they might be cautious about such innovations as allowing incarcerated individuals access to technology and the internet for programming purposes.

SELECTED PRIORITY NEEDS

RESULTS

Organizational issues

- Implementation guides and best practices for the use of secure tablets should be developed that consider agency objectives (e.g., primarily entertainment or programming), the pros and cons of different funding models, and security issues.

Programming

- Agencies should explore the feasibility of developing a publicly funded, national repository of corrections-specific VR content that is accessible to agencies at no or low cost.

Transitional services

- Best practices and collaboration strategies should be developed for information-sharing solutions that connect relevant agencies within and across states so institutions can apply for and secure IDs prior to release.

Coordination and continuity of care

- Implementation guides should be developed that highlight effective strategies for obtaining funding to establish automated solutions to support coordinated reentry case management; this would allow partner access to essential and timely information across domains, including assessments, case plans, contacts and interactions, program referrals, progress in programming or supervision, status, and outcomes.

Equity issues

- Best practices and effective strategies should be developed for ensuring inclusivity; these strategies should account for diversity among both service providers and the target population (e.g., individuals with disabilities, non-English speakers, cultural differences, access to and ability to pay for technology).

To explore how technology can be better leveraged to improve reentry outcomes, the National Institute of Justice, supported by the RAND Corporation in partnership with the University of Denver, hosted a virtual workshop in March 2021. The workshop brought together a group of prison, jail, and probation and parole administrators; community-based service providers; researchers; and other experts to explore the challenges and opportunities associated with this topic.

The project team used a structured brainstorming approach to develop a set of *needs*, which is a term we use to describe a specific requirement tied to either solving a problem or taking advantage of an opportunity to better address a challenge. This report, which describes these needs, is part of an ongoing series of reports on workshops facilitated by the Priority Criminal Justice Needs Initiative. These results are pertinent to a wide variety of audiences, including corrections practitioners and their community-based partners, technology developers, the research community, and organizations that fund research.

Institutions need guidance to better leverage technology to train incarcerated individuals for high-demand jobs; implement tablet programs; and incorporate such technologies as video visitation and virtual reality.

WHAT WE FOUND

Workshop participants identified and prioritized 37 individual needs. Eleven needs were ranked as high priority. Among the high-priority needs, the following themes emerged:

- The participants identified several examples of the effective use of technology to support reentry. They noted, however, that broader adoption would be facilitated by improved guidance in the form of case studies, best practices, and demonstrated effective strategies. For example, institutions need guidance to better leverage technology to train incarcerated individuals for high-demand jobs; implement tablet programs; and incorporate such technologies as video visitation and virtual reality (VR) into family reunification efforts. Correctional agencies also require guidance to effectively collaborate with relevant agencies to provide incarcerated individuals with documentation of identification prior to release. The participants recommended the development of incentives and implementation guidance to support automated solutions for coordinated reentry case management and data-sharing across justice agencies and their community-based partners. Finally, all stakeholders, including private industry, need guidance to help ensure that innovations are designed and implemented with inclusivity in mind so as not to disadvantage any group.
- Recognizing the power of evidence, the participants called for research and evaluation to establish the efficacy of technology-facilitated reentry initiatives and their impact on key outcomes. Participants recommended studies to evaluate the impact of telepresence technologies on individual and group interventions and studies on "in-reach" activities. Furthermore, research is needed to quantify the impact of access to advanced technology on correctional education outcomes.
- The participants noted the potential of VR to significantly improve programming in a variety of areas (e.g., vocational skills, interviewing and other life skills, treatment). Wider adoption of VR could be fostered by the development of pilot programs and evaluation research to identify (1) best practices for content development and implementation in correctional settings and (2) the impact of VR-based interventions on key outcomes. Relatedly, the participants called for exploration of the feasibility of a publicly funded library of VR content that could be easily accessed by the corrections sector.

INTRODUCTION

As of 2019, nearly 1.5 million individuals were held in a U.S. prison (Carson, 2020). Additionally, almost 740,000 individuals were confined in local jails either awaiting trial or serving a sentence (Zeng and Minton, 2021). Although the prison population has decreased by 11 percent over the past decade (the jail population has remained fairly constant over this period), significant concerns remain about the U.S. reliance on incarceration as a sanction and the associated social and economic consequences. For example, it is expensive to maintain a correctional system of such size and scope. The estimated annual cost to fund public corrections agencies (i.e., federal, state, and local expenditures on prisons, jails, juvenile facilities, probation and parole, and immigration detention) exceeds $80 billion (Wagner and Rabuy, 2017). Furthermore, these significant investments in the correctional system have not translated into sustained behavioral change, and efforts to rehabilitate justice-involved individuals have been generally ineffective. More than 95 percent of the incarcerated population will be released to the community at some point (James, 2015). Indeed, each year, more than 600,000 individuals are released from state and federal prisons (Carson, 2020), and another 4.9 million cycle through local jails (Bertram and Jones, 2019). Some of these individuals will be on probation or parole supervision for some time, but many are released unconditionally. Regardless of the release mechanism, many of these individuals will not remain in the community. A recent Bureau of Justice Statistics report found that approximately 66 percent of individuals released across 24 states in 2008 were rearrested within three years and an estimated 61 percent are reincarcerated (Antenangeli and Durose, 2021).

These and other factors support an increased focus on correctional programming and reentry services to achieve better outcomes. Reentry programs are designed to ease the transition from an institutional setting to the community and address critical needs to reduce the risk of reoffending. Preparing individuals for successful reintegration has become a critical mission of the corrections sector, including correctional agencies and their community-based partners (e.g., halfway houses, treatment providers, social service agencies).

According to best practices, reentry planning should begin on the first day of incarceration (La Vigne et al., 2008). Programming and services are typically determined according to the individual's risk and need factors and are provided during three distinct phases: during incarceration; during the critical transi-

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tion phase from incarceration to the community; and through longer-term, community-based supervision and/or support services (James, 2015). Programs and services typically focus on a wide variety of need areas (e.g., antisocial cognition, antisocial associates, vocational or employment needs, educational needs, family reunification, substance use, mental health, and housing), with a focus on the individual's criminogenic factors.

Returning citizens face myriad challenges that can negatively affect the reentry process and, ultimately, their ability to desist from crime. For example, justice-involved individuals have significant educational deficits and are more than twice as likely to have not completed high school compared with the general population (Harlow, 2003). Low levels of education, limited work experience, a lack of marketable skills, a lack of documented identification, and a general reluctance among employers to hire formerly incarcerated individuals are all barriers to meaningful employment (Baer et al., 2006). Furthermore, the National Inventory of Collateral Consequences of Conviction has identified nearly 30,000 examples of federal or state-imposed employment-related restrictions on those with a criminal conviction (Umez and Gaines, 2021).

Returning citizens often struggle to secure stable and affordable housing. For example, a lack of employment, rental history, and good credit might be obstacles; however, legal restrictions also play a role. Across the United States, more than 1,300 laws and regulations affect or restrict housing access for those with a criminal record (Lake, 2021).

Substance use is also prevalent among justice-involved individuals. Indeed, more than half of individuals incarcerated in state prisons and almost two-thirds of individuals sentenced to terms of confinement in jails meet the criteria for drug dependence or abuse (Bronson et al., 2017). That said, relatively few individuals receive treatment while incarcerated. Of those who do, few continue to receive appropriate treatment upon release. Research indicates that formerly incarcerated individuals with a history of substance use and who engage in drug use after release are at a high risk of recidivism (Baer et al., 2006).

Mental illness is also overrepresented among the incarcerated population. Those in prison or jail are three to five times more likely to experience serious psychological distress than the general population (Bronson and Berzofsky, 2017). Chief among the challenges facing returning citizens with mental illnesses is difficulty finding suitable housing. Furthermore, co-occurring mental illness and substance addictions are common (Baillargeon et al., 2010).

Incarceration often results in financial and emotional strain that can significantly disrupt an individual's relationships and family networks. Restoring these relationships can be critical because many returning citizens rely on family for housing and financial assistance immediately upon release (Baer et al., 2006). Research indicates that strong family relationships are linked to less drug use and better employment outcomes (Baer et al., 2006). Furthermore, family ties could support desistance from crime by providing returning citizens with more structure in their daily routines and insulation from criminal influences (Berg and Huebner, 2011).

Successful reentry can be achieved only if these and other critical needs are addressed. Additionally, returning citizens on community supervision must comply with their conditions of release. Therefore, in addition to addressing the needs of returning citizens, the sector has the obligation to protect the public by monitoring compliance with these conditions and ensuring accountability.

> Individuals in institutions need access to modern technology to develop digital literacy and to prepare them to join a workforce that increasingly requires computer skills.

The Role of Technology

The corrections sector is increasingly leveraging technology—for example, by delivering reentry programs in institutional settings and supervision and support services in the community—to enhance mission performance and improve outcomes. Although corrections agencies and their partners have been gradually incorporating technology solutions into operations, the coronavirus disease 2019 (COVID-19) pandemic has forced them to reimagine their business processes. Social distancing requirements have driven the accelerated adoption of technology solutions; however, corrections agencies and their partners recognize that these approaches will have significant value even after the crisis wanes. In other words, technology should be a key element of the "new normal."

Telepresence technologies might provide individuals in custody with better access to critical services (e.g., instruction, legal counsel, counseling, medical or mental health treatment).

The desire to incorporate technology to support reentry is not without challenges. There is a growing recognition that individuals in institutions and community-based facilities need access to modern technology to develop digital literacy and to prepare them to join a workforce that increasingly requires computer skills. However, correctional agencies are generally risk averse and are quick to emphasize the potential security risks associated with access to technology by those in custody. Furthermore, there is a digital divide among organizations in terms of their level of investment in technology in general and, in particular, in their support of reentry objectives.

Telepresence

Telepresence technologies support a variety of activities at every stage of the reentry process. As discussed, maintaining and strengthening relationships during incarceration is important. For a variety of reasons (e.g., time and cost associated with travel; strict institutional policies; harsh, uncomfortable settings; close monitoring; limited physical contact), in-person visitation can be challenging (Duwe and McNeeley, 2020). Indeed, during the COVID-19 pandemic, in-person visitation was suspended in most institutions. Telepresence technologies, in the form of video visitation, can help overcome these obstacles. In some configurations, family members can schedule and conduct a video visit from their home computer, tablet, or smartphone, and at the institution, individuals in custody can use a dedicated station, kiosk, or tablet to visit. Telepresence technologies also might provide individuals in custody with better access to critical services (e.g., instruction, legal counsel, counseling, medical or mental health treatment) while providing the institution with additional benefits, such as less-frequent movement and decreased risk of contraband introduction. Furthermore, by using telepresence, institutions do not have to rely on local resources to provide services, which can be a challenge in rural areas. For example, doctors, instructors, counselors, and therapists can work with the incarcerated population from any location, increasing efficiency for all parties.

Telepresence technologies can allow more-effective and -efficient in-reach activities, which are activities that are designed to engage incarcerated individuals in their reentry plans and facilitate a "warm hand-off" between correctional staff and key community-based partners (e.g., halfway house staff, probation and parole officers, medical and behavioral health providers) in preparation for release. Recognized as a reentry best practice, in-reach typically entails ongoing meetings beginning at least three months prior to release to establish relationships and facilitate continuity of care (Glassheim, 2011). A warm hand-off can be particularly critical for individuals with mental illness, medical needs, substance use disorders, or other significant challenges. Other forms of in-reach could include job fairs, in which employers virtually come to an institution to interview candidates who might be potential hires (Ortiz, 2019). Furthermore, three-way telepresence meetings (i.e., between the individual in custody, a family member, and reentry staff) can facilitate family-inclusive reentry planning, which could include parenting exercises or other activities to prepare the individual for release and adjustment to the community.

Supervision agencies and other community-based providers use telepresence to remotely engage with, monitor, and support their clients (for more discussion of related issues, see Russo et al., 2021). Such applications as Facetime and Zoom can be used by probation and parole officers to conduct virtual meetings or by treatment providers to conduct counseling sessions.

A growing trend is supervision applications that were developed primarily for smartphones (but these applications can be accessed by any internet-enabled device). These applications could be downloaded on a supervisee's phone or installed on a phone provided to them. Using the application, supervision authorities can perform a wide variety of functions. For example, the officer and the supervisee can interact via email, messaging, voice call, or video call. Location monitoring and curfew checks could be accomplished via the phone's native location services. A calendar could be maintained and auto-

mated reminders could be sent to the supervisee about important events, such as court dates and treatment appointments. The supervising officer and the supervisee also could share documents (e.g., conditions of supervision, images of paystubs, proof of community service completion). Some applications are integrated with portable breathalyzers, and results are sent to the officer via the smartphone. Finally, the applications also might support cognitive behavioral interventions, including exercises and journaling activities.

Virtual Reality–Supported Treatment

In recent years, correctional agencies have been exploring virtual reality (VR) for a variety of applications.[1] For example, several state prisons have used VR to teach individuals in custody the life skills necessary for successful reentry (Clarke, 2019). A major impetus for the use of these technologies was a U.S. Supreme Court decision making mandatory life sentences without parole for juveniles unconstitutional (*Miller v. Alabama*, 2012). The court made the decision retroactive, making nearly 2,000 juvenile lifers eligible for resentencing and parole (Clark, 2013). To help these individuals in custody make the unexpected adjustment to the community, a variety of VR scenarios were developed. For example, using VR, an individual in custody can virtually tour the halfway house where they will go after release to help reduce the anxiety associated with a new setting. Other scenarios allow individuals to practice daily life skills, such as using an ATM, doing laundry, or navigating the self-checkout at a grocery store. Other scenarios help individuals improve their mental health or cope with social situations to which they are unaccustomed, such as walking down a crowded street or handling a confrontation in a bar.

The Ohio Department of Rehabilitation and Correction is working on cognitive-based VR scenarios to help in opioid addiction relapse prevention (Addison, 2019). In these scenarios, individuals in custody or supervisees in the community enter an immersive, interactive world, such as a virtual bar, where drugs are available. They might be offered drugs, and how they respond dictates how the scenario plays out. In this way, the individual can practice identifying their triggers for drug use, identifying coping mechanisms, and making decisions in a safe but realistic setting.

The Pennsylvania Department of Corrections is developing scenarios that will allow a parent in custody and their child to simultaneously experience immersive adventures, such as going on safari or riding a rollercoaster (Sahd, 2021). Sharing these experiences and talking about them can help the bonding process. Furthermore, scenarios are in development in which a parent can interact with an avatar representing their child. By role-playing through different situations, incarcerated individuals can practice parenting skills in an immersive and safe environment.

Scenarios are also available for specific interventions. For example, one application used by the Catalan Justice Department is designed to treat perpetrators of domestic violence (Seinfeld et al., 2018). In this scenario, the perpetrator becomes—or embodies—the victim in the form of a life-sized female avatar. As the client moves their head or eyes, the virtual victim moves. In this way, the individual in custody or the supervisee essentially becomes the victim in the simulation and begins to experience what it feels like to have their personal space invaded, be assaulted with abusive language, or feel degraded and demeaned. The goal is to help the perpetrator understand the perspective of the victim, develop better recognition of the emotions felt by the victim, and, ultimately, build empathy.

> Some VR scenarios allow individuals to practice daily life skills, such as using an ATM, doing laundry, or navigating the self-checkout at a grocery store.

Vocational Training and Employment

Several correctional agencies are exploring technology to provide incarcerated individuals with vocational training so that they can leave institutions with meaningful, marketable skills. For example, some agencies are using VR and other simulation tools to teach welding to individuals in custody or help them prepare for their commercial driver's licenses (Meade, 2016). VR-supported job interview training is being explored by the Michigan Department of Corrections (Smith et al., 2020). Scenarios allow individuals in custody to apply for a position at a fictional company and practice their interview skills. An on-screen job coach feature provides real-time nonverbal feed-

back on their performance. After each interview, the individual is scored on their performance and they receive summary feedback.

The Last Mile, a nonprofit organization, has established partnerships with correctional facilities in six states to prepare individuals in custody for careers in software engineering and web development (The Last Mile, undated). In Texas, some individuals receive training and work on geographic information system (GIS) data-conversion projects (e.g., scanning, georeferencing, digitization, data cleanup) for local government agencies (Hamilton, 2015). In Oregon, individuals in custody are trained and certified to audit websites for accessibility for people with disabilities. Individuals in custody provide these services for government entities and private companies through a public-private partnership. Individuals in custody are paid a wage for these services that is far greater than for normal prison industry jobs and are guaranteed job placement after release (KET Education, 2021).

Education

Correctional educational programs are an effective reentry strategy. A meta-analysis of previous studies revealed that, on average, incarcerated individuals who participated in correctional education programs had 43-percent lower odds of recidivating compared with those who did not participate (Davis et al., 2014). Furthermore, every dollar spent on education yields a savings of five dollars on reincarceration costs. Although the value of correctional education is clear, technology to enhance instruction is generally underutilized, which can negatively affect both the learning experience and outcomes (Davis et al., 2014; Tolbert, Hudson, and Claussen Erwin, 2015; Muhlhausen and Hurwitz, 2019). For example, in most states, access to the internet for correctional education programs is very limited (see Table 1).

Although the value of correctional education is clear, technology to enhance instruction is generally underutilized, which can negatively affect both the learning experience and outcomes.

Security concerns are most often cited as obstacles to incorporating technology and online or offline access to the internet for educational purposes. That said, some states (e.g., Oregon, Washington, Ohio, and Florida) have successfully implemented approaches to mitigate these risks (Tolbert, Hudson, and Claussen Erwin, 2015). For example, some institutions have implemented an isolated local server model that provides incarcerated students and teachers with offline access to open educational resources and other content. Other models simulate internet content or employ a restricted internet approach by "white-listing" pre-approved sites. Furthermore, agencies are exploring greater use of laptops, in part because embedded keyboards can make them more conducive to academic work

Table 1. Number of States Offering Access to the Internet for Correctional Education Programs

Type of Internet Access and Number of States Offering Each Type	Overall *N* (%)	Size of State		
		Small *N* (%)	Medium *N* (%)	Large *N* (%)
Only teachers/instructors have access to live internet technology in correctional education classrooms	30 (73%)	21 (75%)	7 (88%)	2 (40%)
Total number of states responding	41	28	8	5
Student access to the internet				
Students do not have access to any internet technology	26 (62%)	18 (64%)	5 (63%)	3 (50%)
Students may only use simulated internet programs	16 (38%)	10 (36%)	4 (50%)	2 (33%)
Students have restricted access to live internet	6 (14%)	4 (14%)	1 (13%)	1 (17%)
Total number of states responding	42	28	8	6

SOURCE: Adapted from Davis et al., 2014, p. 70.

Technologies could include drug and alcohol testing; curfew or location-monitoring systems; remote, automated check-in systems; computer-monitoring software; and polygraphs.

than secure tablets, but they might present more security risks (Tanaka and Cooper, 2020).

Tablets

Correctional institutions across the country are providing individuals in custody access to secure electronic tablets. These purpose-built devices provide a wide range of functionality but do not allow broader access to the internet. For example, individuals can communicate with family and loved ones via messaging, phone calls, and/or video visits. They also can access a variety of content. Some content, such as books, television shows, movies, and games, is for entertainment purposes, while other content focuses on programming. For example, individuals in custody could use tablets to further their educational and vocational goals. Self-paced cognitive-behavioral programs focus on recidivism reduction by teaching individuals in custody to understand the factors underlying their offending behavior and the skills they need to make positive changes in the future. These features are also available to those in community-based correctional facilities and those on probation or parole supervision, although the device used might be different (i.e., the device might not be secure, as required in an institutional setting).

Case Management

Information technology to support case management can be critical to reentry outcomes. Automated case management systems at the agency level are important. However, because returning citizens often interface with multiple entities for services, it is essential that information is effectively shared. Benefits of collaboration include improved service delivery, improved efficiency, reduced duplication of efforts, improved resource-sharing, stakeholder empowerment, and knowledge exchange (Bond and Gittell, 2010). That said, collaboration can be challenging. Common barriers to successful implementation of reentry services include a lack of coordination across partners, a lack of data systems, and systems that might not be as secure as required (Goger, Harding, and Henderson, 2021).

Finally, the corrections sector employs several technologies to monitor supervisees in the community to ensure that they are complying with the conditions of supervision and to maintain accountability. These technologies could include drug and alcohol testing; curfew or location-monitoring systems; remote, automated check-in systems; computer-monitoring software; and polygraphs. Beyond detecting violations, these technologies can help supervisees stay on track and improve their chances of successful reentry.

METHODOLOGY

To explore the challenges and opportunities associated with using technology to support reentry, project staff assembled a panel of corrections professionals, researchers, and other experts. A pool of candidate participants was identified in consultation with the National Institute of Justice (NIJ). Ultimately, a group of 15 experts was convened. The participants and their affiliations are shown in the Workshop Participants box. More details on the process for identifying and selecting workshop participants are provided in the technical appendix.

The workshop was held in March 2021. Because of social-distancing requirements associated with the COVID-19 pandemic, the workshop was held virtually in two stages. During the initial stage, project staff conducted individual interviews with each participant via a web-conferencing application. The length of the interviews ranged between 45 and 60 minutes.

The purpose of the interviews was to gather participant insights on the key challenges and opportunities associated with the use of technology to support prisoner reentry. Discussions were unstructured, and participants were encouraged to speak to the issues that were most germane to them according to their experiences and positions within the reentry process (i.e., jail, prison, probation, parole, community-based programs).

Project staff captured the input and synthetized it into an initial list of 35 *needs*, a term we use to describe a specific

requirement tied to either solving a problem or taking advantage of an opportunity to better address a challenge. The list of needs was provided to the participants to review in preparation for the second stage of the workshop. In this second stage, project staff convened all participants in three, two-hour web-meetings over two days. The purpose of these sessions was to introduce the participants to one another, identify any additional needs that had not been raised, consolidate needs that were closely related, fine-tune the wording of the needs statements, and prioritize the needs. As a result of this process, two additional needs were identified; the final number of needs was 37. More details on the technical methods used to structure the workshop and identify and prioritize needs are provided in the technical appendix. The following section describes the results of the prioritization exercise.

RESULTS

Workshop participants identified a total of 37 needs related to the use of technology to improve reentry outcomes. These needs were organized into six major themes: organizational issues, programming, transitional services, coordination and continuity of care, community supervision, and equity issues. See Figure 1 for the distribution of needs across the six themes. The full list of needs can be found in the technical appendix.

Overall, more than one-quarter of all needs identified (10 of 37) were related to programming, mainly in prisons and jails but also in the community. An additional ten needs were related to supervision in community settings. The prioritization exercise (which we describe in greater detail in the technical appendix) elicited rankings of the importance and probability of success of the identified needs from the participants. These rankings were used to sort needs into three tiers (i.e., top,

Figure 1. Total Number of Needs, by Theme

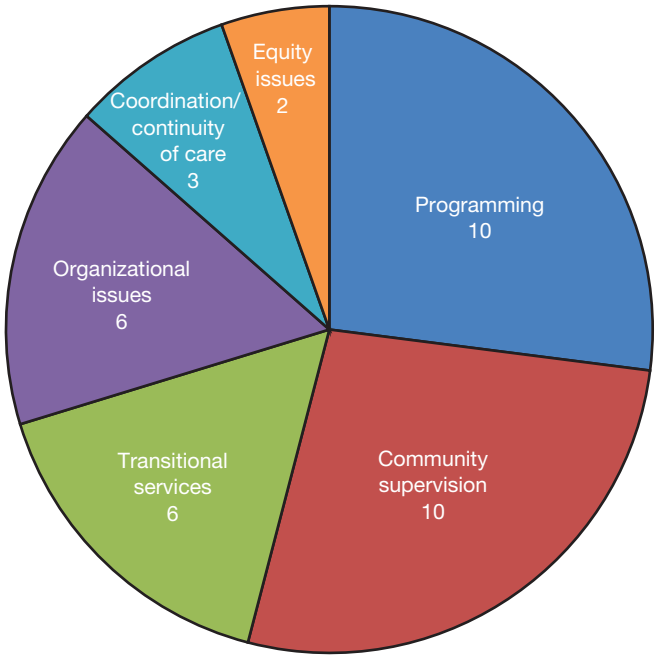
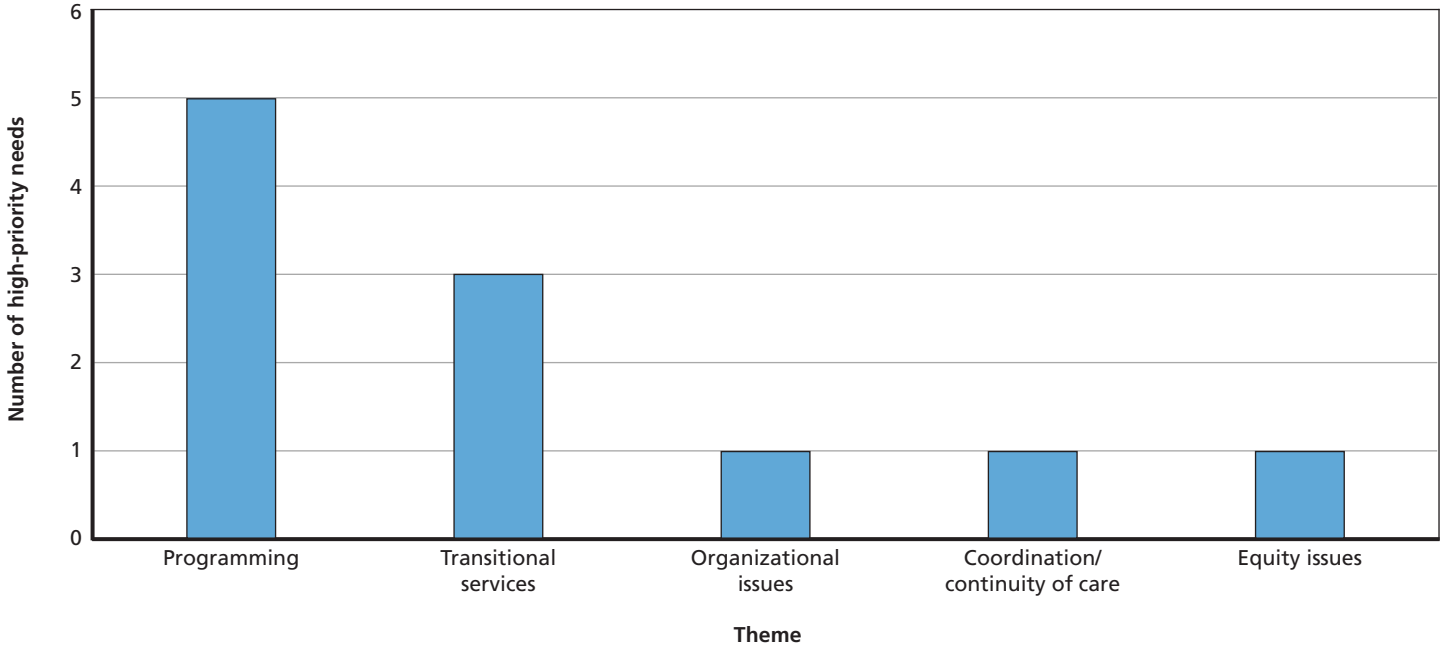


Figure 2. Breakdown of the 11 High-Priority Needs, by Theme



middle, and bottom). Ultimately, 11 of the needs fell into the top tier and are categorized as high-priority needs. See Figure 2 for the breakdown of high-priority needs by theme. Almost half (5 of 11) of the top-tier needs fell into the programming theme. We discuss the high-priority needs (shown in Table 2) in greater detail in the next section. As a result of the prioritization exercise, none of the community supervision needs fell into the top tier, so this theme is omitted from Figure 2, Table 2, and the discussion.

DISCUSSION

This section, which is organized by theme, provides further context to the high-priority needs identified by the participants.

Programming

Five high-priority needs fell under the theme of programming, which is intended to capture technology approaches that, depending on implementation, could bridge several programming areas.

Table 2. The 11 High-Priority Needs, by Category

Problem or Opportunity	Associated Need
Programming	
Technology can be leveraged to better prepare those in custody for future job opportunities.	• Develop and share case studies, best practices, and effective strategies to use technology to train individuals for high-demand jobs (e.g., trades, coding).
Technology offers the opportunity to leverage communication tools (video- or web-based) to deliver reentry-related services remotely; however, there is a lack of evidence.	• Research the efficacy, advantages, and disadvantages of telepresence-enabled service delivery. Specific questions include which types of interventions are best suited to this model, what the implications of individual versus group sessions are, how subgroups respond to this modality (e.g., satisfaction, level of interaction), what the privacy implications are, what quality of service is rendered, and what the impact on key outcomes is when telepresence is used to replace or augment traditional face-to-face interventions. Research also should give facilitators and providers guidance on effective techniques.
VR and/or other simulation technology can be an effective tool to support reentry (e.g., vocational training, interview skills, treatment).	• Develop pilot programs and perform evaluation research to identify (1) best practices for content development and implementation and (2) the impacts of VR or simulation on key outcomes.
It can be challenging for agencies to obtain or create appropriate VR or simulation content.	• Explore the feasibility of developing a publicly funded, national repository of corrections-specific VR content that is accessible to agencies at no or low cost.
Technology can play an important role in correctional education.	• Research the impacts of technology-facilitated educational delivery models on key outcomes.
Transitional services	
It can be challenging to provide incarcerated individuals with the identification they will need upon release.	• Develop best practices and collaboration strategies for information-sharing solutions connecting relevant agencies (e.g., Department of Corrections, local jails, Department of Motor Vehicles, Department of Transportation, Social Security Administration) within or across states so that institutions can apply for and secure IDs for individuals prior to their release.
Families are an important influence in the reentry process; technology can facilitate support for incarcerated individuals and the families to whom they are returning.	• Develop best practices and effective strategies to fully leverage interactive technologies (e.g., video visitation, VR) to support family reunification while mitigating security risks.
Telepresence technology can facilitate in-reach and warm hand-offs to community-based partners (e.g., community supervision staff, service providers, government benefits agencies, employers).	• Develop effective strategies for technology-facilitated in-reach and document the benefits (e.g., improved continuity of care, fewer institutional transfers, individuals who are better prepared for next steps upon release, improved connection with reentry partners, improved likelihood of reporting for first appointment).

Table 2—Continued

Problem or Opportunity	Associated Need
Organizational issues	
The use of electronic devices (e.g., tablets) by incarcerated individuals has the potential to support reentry objectives; however, guidance is needed.	• Develop implementation guides and best practices based on agency objectives (e.g., primarily entertainment or programming), the pros and cons of funding models (e.g., the incarcerated individual pays versus the agency pays), and security issues.
Coordination and continuity of care	
Reentry efforts and continuity-of-care objectives are hindered by a lack of coordination, collaboration, and information-sharing among the stakeholders (e.g., courts, corrections agencies, state and local support agencies, nongovernmental organizations).	• Develop implementation guides that highlight effective strategies for obtaining funding to establish (and incentivize participation in) model automated solutions to support coordinated reentry case management across partners. These automated solutions could track and allow partner access to essential and timely information across domains, including information on assessments, case plans, contacts or interactions, program referrals, progress in programming or supervision, status, and outcomes.
Equity issues	
Technology to support reentry can be much more effective when it is designed and implemented with inclusivity in mind.	• Develop best practices and effective strategies for ensuring inclusivity; these strategies should account for diversity among both service providers and the target population (e.g., individuals with disabilities, non-English speakers, cultural differences, access to and ability to pay for technology, and other responsivity considerations).

Vocational Training

The participants discussed the myriad challenges returning citizens face in finding employment. One major factor is the lack of opportunity to develop marketable skills while incarcerated. Therefore, according to the participants, correctional facilities should better leverage technology to provide individuals in custody with vocational training that can quickly lead to meaningful employment upon their release. Although any job is preferable to no job, research suggests a correlation between a higher occupational level and a lower risk of recidivism (Ramakers et al., 2016; Denver, 2021).

The participants called for the completion of case studies and development of best practices to help agencies incorporate technology to train individuals in custody for high-demand jobs and to effectively expand the scale of successful initiatives. They noted that the training could be directly technology-related (e.g., coding and web development) or simply technology-facilitated preparation for well-paying trade jobs (e.g., welding, trucking). According to one participant, "There is a great demand for trade workers in our area. We need to train those incarcerated for these jobs." The participants emphasized that vocational training programs should be agile enough to adapt to current trends in the local job market and, whenever possible, be structured in modules that can be completed in a relatively short period of time. This is particularly important in jail settings, where the average length of stay is 26 days (Zeng and Minton, 2021).

According to the participants, correctional facilities should better leverage technology to provide individuals in custody with vocational training that can quickly lead to meaningful employment upon their release.

Remote Service Delivery

The COVID-19 pandemic has forced the corrections sector to accelerate the use of telepresence technologies to remotely deliver services (e.g., education, treatment, counseling) in both the institutional and community contexts. Although many agencies moved in this direction out of necessity to comply with social-distancing requirements, participants noted that this approach offers several advantages, including efficiency, flexibility, reduced travel, reduced costs, and increased security. With that said, the participants also recognized potential disadvantages. For example, telepresence interactions might be more impersonal and less effective than in-person interactions (e.g., it can be difficult to read body language). Furthermore, facilitation of virtual group sessions can pose unique challenges for staff (e.g., it is challenging to monitor participant engagement). According to participants, a greater evidence base is needed to help agencies better understand the advantages, disadvantages, and efficacy of telepresence as a mode of service delivery. As one participant noted, "Evidence is needed to guide practice; so, are younger clients more amenable to video interventions? Should sessions be shorter to mitigate 'Zoom fatigue?'" Specific lines of inquiry include determining which types of interventions are best suited to a virtual model, what the implications of individual versus group dynamics are, how different subgroups respond to this modality (e.g., satisfaction, level of interaction/engagement), what the privacy implications are, what quality of service is rendered, and what the impact on key outcomes is when telepresence is used to replace or augment traditional face-to-face interventions. Research also should provide facilitators with guidance and effective techniques.

Virtual Reality

The corrections sector is only beginning to explore the promise of VR and other simulation technology to improve reentry outcomes. Applications in the institutional context include teaching individuals in custody the basic life skills necessary for successful reentry, virtually touring a new facility prior to transfer, or coping with social situations to which individuals are unaccustomed. According to one workshop participant, "Many incarcerated individuals are not prepared to return to the real world. Routine activities like going to a doctor's office or Walmart can be anxiety-inducing for people who have been locked up a long time. VR can really help." Other applications might be suitable for supervisees in the community, such as in improving mental health, developing vocational skills, practicing for job interviews, building empathy, developing anger management skills, and identifying substance use triggers.

Although participants clearly recognized the promise of VR, they argued that more evidence of its efficacy is needed to support further investment. They called for the development of additional pilot programs accompanied by evaluation research to identify best practices for implementing VR, along with as research on the impacts of deployment on key outcomes, such as mental health, employment, substance use, and recidivism.

The participants identified a second, related high-priority need with respect to VR. Assuming that the evidence supports the effectiveness of VR in supporting reentry, barriers to its use remain. For example, although equipment (e.g., computer hardware, headsets, hand-motion controllers) is increasingly affordable, developing scenarios can be expensive, and most agencies lack the internal capacity to create VR content. Given that most content would be useful for any agency across the country, the participants called for an examination of the feasibility of developing a publicly funded national repository of corrections-specific VR content. In such a model, an agency could access the content at no or low cost and implement in their environment, eliminating the need for each agency to create their own content.

Other applications of VR might be suitable for supervisees in the community, such as in improving mental health, developing vocational skills, practicing for job interviews, building empathy, developing anger management skills, and identifying substance use triggers.

Education

The participants recognized the impact of correctional education on reentry outcomes. However, they suggested that technology can be better leveraged to deliver programming. The participants believed that correctional education, to the extent possible, should mirror the community college experience, with the same courses and the same modern instructional methods. According to one participant, "Correctional education should be normalized. The classroom experience within a facility should be as close as possible to the real world." Therefore, teachers and students should have access to technology-based instructional tools and devices to enhance the learning experience.

Furthermore, the participants noted that incarcerated individuals need to develop computer and digital literacy skills to succeed in the community. Therefore, they require access to and training on the tools (e.g., laptops, tablets) that they will use upon release. They also will need to know how to access the information necessary to function in society today, much of which is available only online (e.g., applications for jobs, housing, benefits). To accomplish these objectives, correctional education programs require access to the internet, whether directly or offline, and institutions need to manage the associated security risks. Corrections is inherently a risk-management profession, and administrators can successfully balance security concerns with reentry objectives.

To foster greater use of advanced technologies in correctional education, the participants recommended research to study the impact of this approach on both the quality of instruction and key outcomes, such as obtaining employment and recidivism.

Transitional Services

Three high-priority needs were related to critical activities during the transitional phase between incarceration and release to the community.

Need for Identification

The lack of state-issued identification can be a significant hindrance to successful reentry. Indeed, "Housing and employment—two important components of successful reentry—are nearly impossible to obtain without identification" (National Reentry Resource Center, 2016, p. 2). Identification is often required to access social services in the community, apply for benefits, obtain housing, or apply for a job; however, after a period of incarceration, many individuals might not have such documents as a birth certificate or drivers' license.

> Providing individuals with identification prior to release can facilitate quicker and more-successful reintegration to the community.

Obtaining an ID upon release can be challenging because of related costs, transportation issues, and/or difficulty in obtaining other supporting documentation. Providing individuals with identification prior to release can facilitate quicker and more-successful reintegration to the community.

The participants called for the development of best practices and collaboration strategies to leverage technology to connect and coordinate relevant agencies to share information so that returning citizens leave the institution with the necessary identification. For example, Texas law mandates that the Texas Department of Criminal Justice (TDCJ) work with the Department of State Health Services and the Department of Public Safety to provide personal identification for all those who are eligible prior to their release. These agencies leverage technology, such as electronic databases, mobile cameras, and specialized software, to increase the TDCJ's capacity to issue state identification cards. Ultimately, the goal is for every eligible individual to leave a Texas prison with a valid birth certificate, Social Security card, and a state-issued identification card in hand ("TDCJ Helps Secure State-Issued IDs to Aid Offender Reintegration," 2014). Furthermore, the participants argued that solutions should be explored to facilitate similar collaboration *between* states. This is particularly important in cases in which an individual is incarcerated in an institution outside the state to which they will be returning upon release. This is a routine occurrence in the federal prison system; individuals might be incarcerated in institutions located across the country. However, it is also common in multistate metropolitan areas (e.g., New York, New Jersey, and Connecticut; Maryland, Virginia, and the District of Columbia). The participants recognized that interstate collaboration would be more challenging, but they argued that potential solutions to these scenarios should be explored.

Family Support

Technology, according to the participants, can be better leveraged to improve the connection between incarcerated individuals and their families and social support systems. As discussed earlier, these relationships can be critically important to the reentry process. Although preparing the individual for return to the family is essential, the participants noted that it is also important to prepare family members, particularly in cases of lengthy incarceration. Many families have learned to live without their loved ones, and the transition period can be stressful for all concerned because roles and dynamics might have changed. The participants recognized that telepresence tools can allow more-frequent interactions than in-person visits and can support family-inclusive reentry planning. According to one participant, "In our jail, we really work to support the families of those incarcerated—virtual visits help make that possible." Furthermore, as discussed, VR can potentially enhance family reunification efforts through realistic but remote bonding exercises and parenting skill development.

Although these tools have the potential to strengthen family relationships and improve reentry outcomes, the participants believed that the field would benefit from more guidance on implementation. They called for the development of best practices and effective strategies to help agencies understand how to implement these tools to achieve the best outcomes while mitigating potential security risks that might arise (e.g., inappropriate behavior by an individual outside the system on video).

Technology-Facilitated In-Reach Programs

The participants discussed the importance of in-reach programs designed to engage incarcerated people in their reentry plans and connect these individuals with key community-based partners (e.g., halfway house staff, probation and parole officers, medical and behavioral health providers) in preparation for release. Recognized as a reentry best practice, in-reach meetings typically were held in person at the correctional facility prior to the pandemic; however, social-distancing regulations put in place during the COVID-19 pandemic made this impossible. As a result, agencies increasingly leveraged telepresence technology so that these interactions could be conducted remotely. The participants noted that the use of telepresence technology for in-reach should continue, and perhaps expand, once the pandemic has waned. To support broader adoption, the participants recommended the development of effective strategies and best practices for technology-facilitated in-reach. Furthermore, research is needed to document the impact of this approach. Research questions include whether technology-facilitated in-reach improves the returning citizen's link to community-based reentry partners, improves continuity of care, better prepares individuals for release, and increases the likelihood of individuals reporting for their first appointment to a probation and parole officer.

Organizational Issues

The participants discussed the value of access to electronic tablets from a variety of perspectives; they also noted the wide variation in how these tools are implemented in agencies. For example, some agencies might emphasize the benefits of providing incarcerated individuals with in-cell entertainment (e.g., music, movies, gaming), which keeps them occupied and could lower the risk of misbehavior. Other agencies stress the efficiencies of automating administrative processes (e.g., ordering from commissary, filing grievances, requesting medical appointments), which can reduce paperwork and associated burden on staff. Still others promote these devices as a tool to support reentry objectives through increased communication with families and access to self-help content. Who pays for the device (i.e., the agency or the individual in custody) can vary across agencies, although the costs of services (e.g., messaging, calls, visits) available through the device and of downloadable content are generally borne by the individual and/or their families. In agencies in which the individual buys the tablet with their own funds, there might be no requirement to use the device for rehabilitative programming. In other agencies, reha-

According to the participants, reentry outcomes could be improved through better coordination and collaboration among the various entities that provide services to justice-involved individuals throughout the reentry process.

bilitative programming is a primary objective. To help maximize the value of these tools, the participants recommended the development of implementation guides and best practices for the field. Considerations to be examined should include how to achieve the agency's primary objectives (e.g., entertainment or programming); what the pros and cons are of different funding models (e.g., individual pays versus agency pays), and how fair each model is; what security issues and mitigation strategies exist; and what infrastructure issues (e.g., WiFi connectivity and bandwidth) exist.

Coordination and Continuity of Care

According to the participants, reentry outcomes could be improved through better coordination and collaboration among the various entities that provide services (e.g., courts, prisons, jails, community corrections agencies, state and local social service agencies, treatment providers, nongovernmental organizations) to justice-involved individuals throughout the reentry process. Indeed, according to one participant, "To best serve their clients, community corrections and service providers need to know what happened (e.g., programs, services, treatment) while [their clients] were incarcerated." This is best accomplished through automated information systems and data-sharing protocols. Although some jurisdictions have been successful in efforts to coordinate reentry partners, participants acknowledged that this remains the exception to the rule. The participants recommended a study of positive outliers, such as the nationally recognized Allegheny County Jail Collaborative in Pennsylvania. This entity provides coordinated reentry services beginning in the county jail and continues providing services upon an individual's release via community-based providers and Adult Probation community resource centers. The participants reported believing that the field could benefit from the success in Allegheny County and other jurisdictions and recommended the development of implementation guides for coordinated reentry services. These guides should highlight effective strategies for obtaining funding to establish (and incentivize participation in) automated solutions to support coordinated reentry case management and data-sharing across partners. These automated solutions would track and allow partner access to essential and timely information across domains, including assessments, case plans, contacts or interactions, program referrals, progress in programming or supervision, status, and outcomes.

> To the extent possible, solutions should be designed with inclusivity in mind so that no groups are unfairly disadvantaged.

Equity Issues

The participants discussed equity and fairness issues with respect to technologies to support reentry. They argued that, to the extent possible, solutions should be designed with inclusivity in mind so that no groups are unfairly disadvantaged. For example, English is the second language for a segment of the corrections population, and these individuals would not benefit as much from applications and/or content that is not available in their native languages. Physical disabilities (e.g., visual or hearing impairment) also might be a hindrance, as are some learning disabilities. Furthermore, platforms and content should be designed to be culturally sensitive. Finally, the participants identified the digital divide as an equity issue. Disadvantaged individuals might not have the digital literacy needed to use these tools, and some individuals might not have access to broadband internet. Furthermore, regardless of whether the individual is incarcerated, there might be a fee involved in acquiring a digital tool (e.g., tablet, smartphone) in addition to the cost of accessing the content or services. This can pose a barrier to individuals with limited financial capacity and, indeed, some believe the pricing structure to be exploitative. According to one workshop participant, "Justice-involved individuals need access to technology, but we need models that do not place the financial burden on the incarcerated individual." To bring these issues to the forefront, the participants recommended the development of best practices and effective strategies for ensuring inclusivity as these tools are created and implemented.

CONCLUSION

The corrections sector is increasingly leveraging technological innovations to support prisoner reentry into the community. This trend has been accelerated by the COVID-19 pandemic, which has forced agencies to lean heavily on technology to deliver a wide variety of treatment and supervision services remotely. Furthermore, the sector is recognizing that returning citizens need access to technology at each stage of the reentry process; at the same time, the security risks of such access to technology need to be minimized. This is critical to providing access to the best vocational and educational content but also to helping individuals become familiar and proficient with the technology necessary for a productive life in the 21st century.

To explore the challenges and opportunities associated with leveraging technology to support prisoner reentry, project staff assembled a group of prison, jail, and probation and parole administrators; community-based service providers; researchers; and other experts. Project staff conducted individual interviews with each participant and virtual conferencing sessions with the entire group to identify key needs that, if addressed, would significantly help the corrections sector meet these challenges. Workshop participants identified and prioritized 37 individual needs. Eleven needs were ranked as high-priority. Among the high-priority needs, several themes emerged.

The participants called for guidance in the form of case studies, best practices, and effective strategies to support several areas of implementation. For example, institutions need guidance to better leverage technology to train incarcerated individuals for high-demand jobs; to incorporate technologies, such as video visitation and VR, into family reunification efforts; and to maximize the value of access to electronic tablets for those who are incarcerated. Correctional agencies require guidance to effectively collaborate with relevant agencies to provide incarcerated individuals with identification prior to release. The participants recommended the development of an implementation guide to support and incentivize automated solutions for coordinated reentry case management and data-sharing across agencies and their community-based partners. Finally, all stakeholders, including private industry, need guidance to help ensure that innovations are designed and implemented with inclusivity in mind so as not to disadvantage any group.

> Participants called for an exploration of the feasibility of a publicly funded library of VR content that could be easily accessed by the corrections sector.

The participants noted that evaluation research is needed to establish the efficacy of technology-facilitated reentry initiatives and determine their impact on key outcomes. Participants recommended studies to evaluate telepresence-enabled in-reach activities, technology-facilitated (e.g., with access to the internet) correctional education, and access to electronic devices (e.g., tablets) for programming. Furthermore, evidence is needed on (1) the advantages and disadvantages of using telepresence technologies (in institutions and in the community) to deliver individual and group interventions and (2) the impact—if any—on outcomes.

Finally, noting the potential of VR to significantly improve programming, the participants called for the development of pilot programs to support evaluation research to identify best practices for content development and implementation in correctional settings and to determine the impact of VR-based interventions on key outcomes. Relatedly, the participants called for an exploration of the feasibility of a publicly funded library of VR content that could be easily accessed by the corrections sector.

The small number of participants in the workshop introduces the potential for bias in our results, and a different group of participants might have identified other priorities. We describe this limitation in more detail in the appendix, noting the potentially low representation of participants from jail settings compared with prisons. We also note that there is little mention of resource shortfalls (i.e., funding and staff) that could be potential barriers to adoption of needed technologies. This should not be assumed to imply that participants did not consider resource shortfalls to be barriers; they did. The needs identification process used and described in this report merely assumes that identifying certain needs as high-priority would influence decisionmakers to allocate more of their limited resources toward addressing the associated barriers.

Technology can support prisoner reentry in a variety of ways. Addressing the high-priority needs outlined in this report

can help harness the power of technology and lead to better outcomes for justice-involved individuals, their families, their communities, and public safety overall.

TECHNICAL APPENDIX

In this appendix, we present additional details on the workshop and our process for identifying and prioritizing research and technology needs and turning them into the research agenda that is presented in the main report. The descriptions in this appendix are drawn and adapted from those in previous publications of the Priority Criminal Justice Needs Initiative (PCJNI) and reflect adjustments to the needs identification and prioritization process implemented at this workshop.

Workshop Scope and Participant Selection

The topics for PCJNI workshops are selected by reaching a consensus among the action officers and subject-matter experts at NIJ and research staff at the organizations that will be facilitating the workshop. Multiple topic areas, accompanied by brief scoping descriptions, are typically suggested months before the workshop by one or more of the parties involved, and staff engage in group deliberations with NIJ to reach consensus on the topic. We then engage in further scoping of the workshop to craft a discussion agenda through literature review and/or informal discussions with other practitioners and subject-matter experts. Once the topic and scope have been determined, we recruit participants first by identifying knowledgeable individuals through existing professional and social networks (e.g., LinkedIn) and by reviewing literature published on the topic. We then extend an invitation to those individuals and provide a brief description of the workshop's focus areas.

For this workshop on leveraging technology to support reentry, we assembled an initial list of potential participants with the intent to achieve a balance of those with perspectives and expertise in jails, prisons, community-based residential centers, probation and parole organizations, and juvenile justice organizations. The potential participants were selected according to their roles in the agency (with a preference for administrators in the reentry space) and their positions in the reentry process. We also attempted to gain representation from local, state, and federal government agencies and from varied geographic locations. Finally, we attempted to engage academics and other experts with an understanding of specific technologies that were used or explored for use in corrections (e.g., correctional education and VR). This initial list of participants was edited with input from NIJ and the team members from RAND and the University of Denver until a final list of 20 potential participants was created. These 20 individuals were invited to attend; five either did not respond or elected not to participate.

The goal of the process of expert elicitation was to gather unbiased, representative results from experts and practitioners in the field. However, some limitations could affect the findings. The process typically elicits opinions from a relatively small group of experts. To limit the effect of group size on the representativeness of the results, we strive to make the group as representative as possible of different disciplines, perspectives, and geographic regions. However, the final output of the workshop likely is significantly influenced by the specific group of experts invited to participate. It is possible that the findings from the workshop could be different if a different group of experts were selected. For example, efforts to engage more representation from local jails were unsuccessful, resulting in a less-than-ideal balance of representation compared with state prison systems. Moreover, although the discussion moderators make every effort to act as neutral parties when eliciting opinions from the collected experts, the background and experience of the moderators has the potential to influence which questions they pose to the group and how they phrase those questions. This also could introduce bias that could influence the findings.

Identification and Prioritization of Needs

To develop and prioritize a list of technology and policy issues that are likely to benefit from research and investment, we followed a process similar to one that we used in previous PCJNI workshops (see, for example, Jackson et al., 2015; Jackson et al., 2016, and references therein). Participants discussed and refined problems and identified potential solutions (or *needs*) that could address each problem. In addition, needs could be framed in response to opportunities to improve performance by adopting or adapting a new approach or practice (e.g., applying a new technology or tool in the sector that had not been used before). After identifying and refining the needs, we used a voting process based on the Delphi Method, a technique developed at RAND, to elicit prioritization information from the group about the identified needs (RAND Corporation, undated).

Prior to the COVID-19 pandemic, PCJNI workshops were conducted in person in a group setting. However, under the restrictions and mitigations implemented in response to the COVID-19 pandemic, our participants and staff were unable to travel. Our typical in-person format involved a two-day,

14-hour in-person meeting (eight hours the first day, six hours the second day). However, drawing on the experience of several organizations and individuals in running and participating in high-intensity virtual events, we determined that it would not be advisable to try to directly replicate this meeting format using virtual conferencing tools. Instead, we prepared a multistage process, as follows:

- interviews with each participant, either individually or in small groups, for approximately an hour to build an initial picture of their views and ideas
- a set of shorter, more-focused virtual sessions to provide the group the opportunity to react to and shape the consolidated picture that came from our synthesis of the individual interview input
- a final voting stage after the last interactive session, in which participants provided their final assessment of the rankings of the different needs.

Interviews

During the interviews, we asked practitioner panelists to discuss the challenges that they or their colleagues have experienced. We asked panelists who were not justice practitioners (e.g., academics) to speak from their experience working with practitioners. We also asked them to identify areas in which additional investment in research and development could help alleviate the challenges. During these discussions, participants suggested additional areas that were potentially worthy of research or investment. We consolidated and integrated the problems, opportunities, and potential solutions described by the participants in the separate interviews into a single summarized list. In advance of the first meeting of the virtual workshop, panelists were provided with the list of issues and needs.

Virtual Sessions

Once each participant had been interviewed and the needs were consolidated, we held three two-hour virtual meetings using Zoom, a virtual meeting platform. The meetings were configured such that the participants could see each other's video feeds and collaborate to refine and edit the consolidated needs.

At the end of the discussion of each group of needs, participants were given an opportunity to review and revise the list of problems, opportunities, and potential solutions that they had identified. The panelists' combined lists for each topic were displayed one by one on the screenshare portion of Zoom using Microsoft PowerPoint slides that were edited in real time to incorporate participants' revisions and comments.

Once the group reached consensus on a group of needs, we conducted a real-time voting prioritization exercise using Delphi techniques. We asked the participants to anonymously vote using a web-based polling system (specifically, the PollAnywhere feature from Turning Technologies). Each participant was asked to score each need and associated strategies to address those needs using a 1–9 scale for two dimensions: importance and probability of success.

For the *importance* dimension, participants were instructed that 1 was a low score and 9 was a high score. Participants were told to score a need's importance with a 1 if it would have little or no impact on the problem and with a 9 if it would reduce the impact of the problem by 20 percent or more. Anchoring the scale with percentage improvements in the need's performance is intended to help make rating values more comparable from participant to participant.

For the *probability of success* dimension, participants were instructed to treat the 1–9 scale as a percentage chance that the need could be met and broadly implemented successfully. That is, they could assign the need's chance of success between 10 percent (i.e., a rating of 1) and 90 percent (i.e., a rating of 9). This dimension was intended to include not only technical concerns (i.e., whether the need would be hard to meet) but also the effect of factors that might cause practitioners to not adopt the new technology, policy, or practice even if it were developed. Such factors could include cost, effect on practitioner workloads, other staffing concerns, and societal concerns.

After the participants provided their individual ratings using the web-based polling system (i.e., for importance or probability of success), we displayed a histogram-style summary of participant responses within the polling system's interface. If there was significant disagreement among the participants, they were asked to discuss or explain their votes at one end of the spectrum or the other. (The degree of disagreement was determined by our visual inspection of the histogram.) If a second round of discussion occurred, participants were given an opportunity to adjust their rating on the same question. This process was repeated for each question and dimension at the end of each topic area.

Post-Session Prioritization

Once the participants had completed this rating process for all of the topic areas, we put the needs into a single prioritized list. We ordered the list by calculating an expected value using

the method outlined in Jackson et al., 2016. For each need, we multiplied the final (second-round) ratings for importance and probability of success to produce an expected value. We then calculated the median of that product across all of the respondents and used that as the group's collective expected value score for the need.

We clustered the resulting expected value scores into three tiers using a hierarchical clustering algorithm. The algorithm we used was the "ward.D" spherical algorithm from the "stats" library in the R statistical package, version 4.0.2. We chose this algorithm to minimize within-cluster variance when determining the breaks between tiers. The choice of three tiers is arbitrary but was done in part to remain consistent across the set of technology workshops we have conducted for NIJ. Also, the choice of three tiers represents a manageable system for policymakers. Specifically, the top-tier needs are the priorities that should be the primary policymaking focus, the second-tier needs should be examined closely, and the third-tier needs are probably not worth much attention in the near term (unless, for example, they can be addressed with existing technology or approaches that can be readily and cheaply adapted to the identified need).

Because the participants initially rated the needs one topic area at a time, we gave the participants an opportunity at the end of the workshop to review and weigh in on the tiered list of all identified needs. The intention of this step was to let panel members see the needs in the context of the other tiered needs and allow them to consider whether there were needs that appeared too high or low relative to the others. To collect these assessments, we emailed the entire tiered list in a Microsoft Word document to the participants. This step allowed the participants to see all of the ranked needs collected across all sessions, providing a top-level view that was complementary to the rankings provided session by session. Participants were then asked to examine where each of the needs landed on the overall tiered list and whether this ordering was appropriate or needed fine-tuning. Participants had the option to indicate whether each problem and need pairing should be voted up or down on the list. An example of this form is provided in Table A.1.

We then tallied the participants' responses and applied those votes to produce a final list of prioritized and tiered needs. To adjust the expected values using the up and down votes from the third round of prioritization, we implemented a method equivalent to the one we used in previous work (Hollywood et al., 2016). Specifically, if every panel member voted "up" for a need that was at the bottom of the list, then the collective effect of those votes should be to move the need to the top. (The opposite would happen if every panelist voted "down" for a need that was at the top of the list.) To determine the point value of a single vote, we divided the full range of expected values by the number of participants voting.

To prevent the (somewhat rare) situation in which small numbers of votes have an unintended outsized impact—for example, when some or all of the needs in one tier have the same or very similar expected values—we also set a threshold that at least 25 percent of the workshop participants must have voted on that need (and then rounded to the nearest full participant). For this workshop, there were 13 voting participants (15 participants contributed at various stages, but only 13 individuals voted at the interactive sessions), so, for any votes to have an effect on changing a need's tier, at least three participants would have had to have voted to move the need up or down (with no votes going in the other direction).

After applying the up and down vote points to the second-round expected values, we compared the modified scores with the boundary values for the tiers to see whether the change was enough to move any needs up or down in the prioritization. (Note that there were gaps between these boundaries, so some of the modified expected values could fall in between tiers. See Figure A.1.) As with prior work, we set a higher bar for a need to move up or down two tiers (from Tier 1 to Tier 3, or vice versa) than for a need to move to the tier immediately above or below. Specifically, a need could *increase by one tier* if its modified expected value was higher than the highest expected value score in its initial tier. And a need could *decrease by one tier* if its modified expected value was lower than the lowest expected value in its initial tier. However, *to increase or decrease by two tiers* (which was possible only for needs that started in Tier 1 or Tier 3), the score had to increase or decrease by an amount that fully placed the need into the range two tiers away. For example, for a Tier 3 need to jump to Tier 1, its expected value score had to fall within the boundaries of Tier 1, not just within the gap between Tier 1 and Tier 2. See Figure A.1, which illustrates the greater score change required for a need to move two tiers (one need on the far right of the figure) compared with one tier (all other examples shown).

Applying these decision rules to integrate the participants' third-round inputs into the final tiering of needs resulted in numerical separations between tiers that were less clear than the separations that resulted when we used the clustering algorithm in the initial tiering. This can occur because, for example, when the final expected value score for a need that was originally

in Tier 3 falls just below the boundary value for Tier 1, that need's final score could be higher than that of some other needs in the item's new tier (Tier 2). See Figure A.2, which shows the distribution of the needs by expected value score after the second-round rating process and then after the third-round voting process.

As a result of the third round of voting, 34 needs did not change position, 3 needs rose one tier, and no needs changed two tiers. The output from this process became the final ranking of the panel's prioritized results.

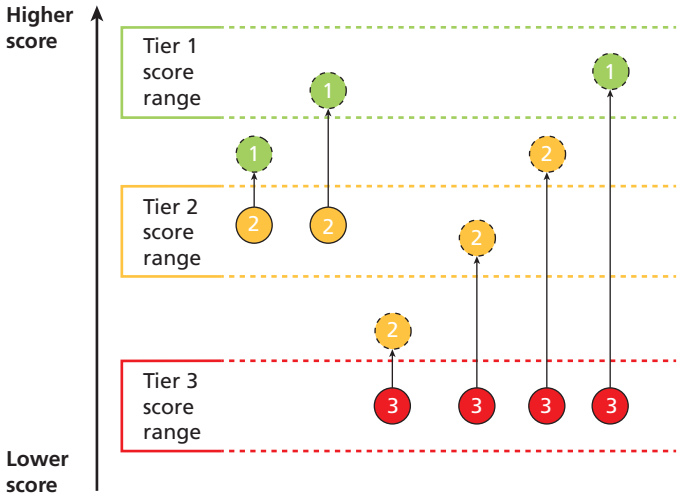
The complete list of identified needs is shown in Table A.2, and the needs are sorted by tier and theme.

Table A.1. Example of the Delphi Round 3 Voting Form

Question	Tier	Vote Up	Vote Down
Tier 1			
Issue: It can be challenging for agencies to obtain or create appropriate VR or simulation content. **Need:** Explore the feasibility of developing a publicly funded, national repository of corrections-specific VR content that is accessible to agencies at no or low cost.	1		
Issue: Families are an important influence in the reentry process; technology can facilitate support for incarcerated individuals and the families to whom they are returning. **Need:** Develop best practices and effective strategies to fully leverage interactive technologies (e.g., video visitation, VR) to support family reunification while mitigating security risks.	1		
Tier 2			
Issue: The educational content available electronically in a correctional setting is often lacking compared with what can be found in the community. **Need:** Explore the feasibility of public-private partnerships to provide incarcerated individuals with free or low-cost offline access to content beyond open educational resources (i.e., the most up-to-date and relevant materials, literature that is relevant and interesting to the population).	2		
Issue: Returning citizens face challenges obtaining Medicaid and other government benefits in a timely manner, which can lead to negative outcomes and unnecessary expense. **Need:** Develop technology solutions and effective strategies to facilitate the application process so that eligible individuals have critical benefits in place upon release.	2		
Tier 3			
Issue: The use of multiple assessment tools by agencies and service providers can introduce inefficiencies, duplication of effort, lack of continuity of care, and frustration for individuals. **Need:** Assess the viability of common, generic, validated, and gender-sensitive and culturally sensitive assessment or case-planning tools (static, dynamic, protective factors) used by stakeholders in a geographic area or jurisdiction; evaluate the potential impact on quality of service provision and efficiency.	3		
Issue: Smartphone applications can help those on community supervision or in residential facilities; however, some cannot afford a device and/or monthly plan payments. **Need:** Explore such strategies as public-private partnerships with cellular providers to give free or low-cost devices and services to returning citizens and maximize the use of the Federal Communications Commission's Lifeline program.	3		

NOTE: Shaded cells indicate that up or down votes were not possible (e.g., Tier 1 is the top tier, so it was impossible to upvote items in that tier).

Figure A.1. How a Need's Increase in Expected Value Might Result in Its Movement Across Tier Boundaries



NOTE: Each example need's original tier is shown by a circle with a solid border (the two needs starting in Tier 2 and the four needs starting in Tier 3). Each need's new tier after the third-round score adjustment is shown by the connected circle with a dotted border.

Figure A.2. Final Distribution of the Tiered Needs

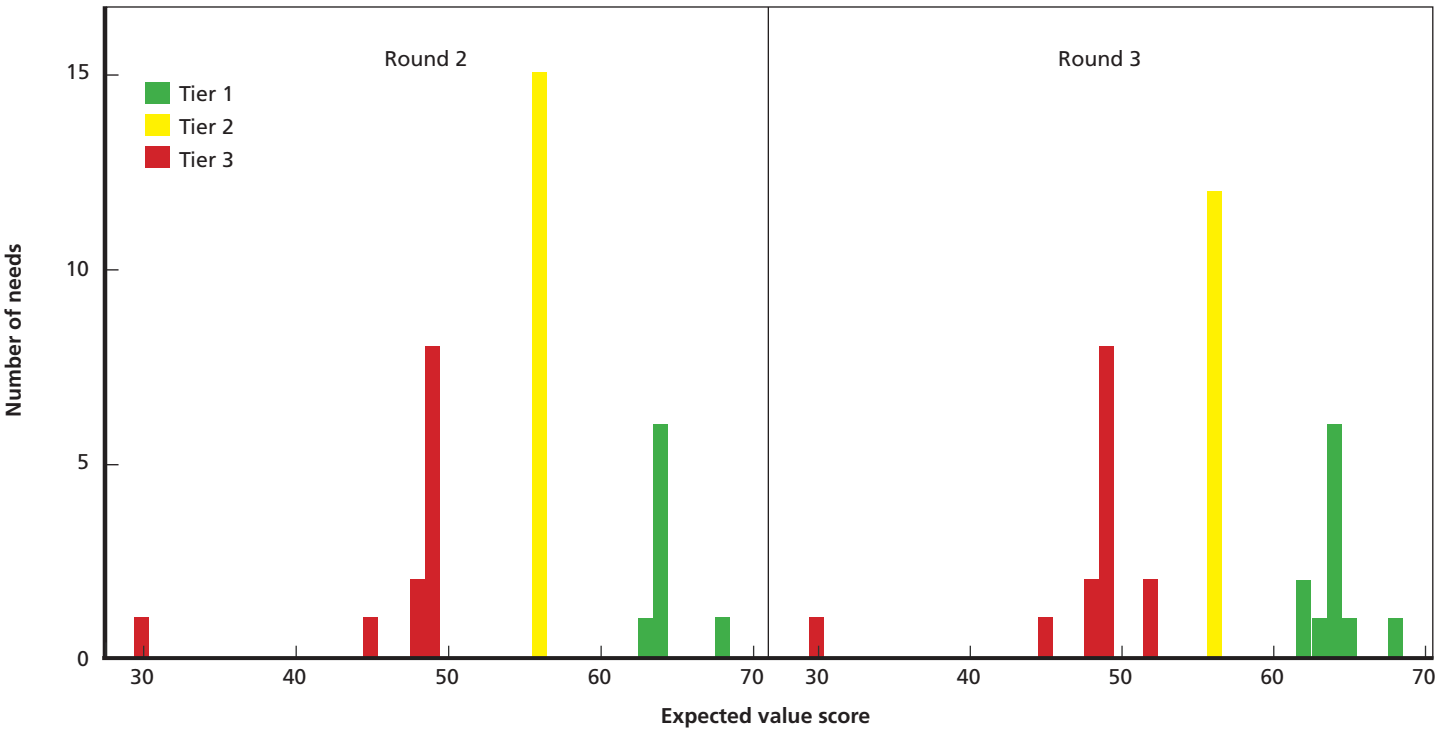


Table A.2. Complete List of Needs, by Tier

Issue or Problem	Associated Need	Tier
Programming		
Technology can be leveraged to better prepare those in custody for future job opportunities.	• Develop and share case studies, best practices, and effective strategies to use technology to train individuals for high-demand jobs (e.g., trades, coding).	1
Technology offers the opportunity to leverage communication tools (video- or web-based) to deliver reentry-related services remotely; however, there is a lack of evidence.	• Research the efficacy, advantages, and disadvantages of telepresence-enabled service delivery. Specific questions include which types of interventions are best suited to this model, what the implications of individual versus group sessions are, how subgroups respond to this modality (e.g., satisfaction, level of interaction), what the privacy implications are, what quality of service is rendered, and what the impact on key outcomes is when telepresence is used to replace or augment traditional face-to-face interventions. Research also should give facilitators and providers guidance on effective techniques.	
VR and/or other simulation technology can be an effective tool to support reentry (e.g., vocational training, interview skills, treatment).	• Develop pilot programs and perform evaluation research to identify (1) best practices for content development and implementation and (2) the impacts of VR or simulation on key outcomes.	
It can be challenging for agencies to obtain or create appropriate VR or simulation content.	• Explore the feasibility of developing a publicly funded, national repository of corrections-specific VR content that is accessible to agencies at no or low cost.	
Technology can play an important role in correctional education.	• Research the impacts of technology-facilitated educational delivery models on key outcomes.	
Transitional services		
It can be challenging to provide incarcerated individuals with the identification they will need upon release.	• Develop best practices and collaboration strategies for information-sharing solutions connecting relevant agencies (e.g., Department of Corrections, local jails, Department of Motor Vehicles, Department of Transportation, Social Security Administration) within or across states so that institutions can apply for and secure IDs for individuals prior to their release.	1
Families are an important influence in the reentry process; technology can facilitate support for incarcerated individuals and the families to whom they are returning.	• Develop best practices and effective strategies to fully leverage interactive technologies (e.g., video visitation, VR) to support family reunification while mitigating security risks.	
Telepresence technology can facilitate in-reach and warm hand-offs to community-based partners (e.g., community supervision staff, service providers, government benefits agencies, employers).	• Develop effective strategies for technology-facilitated in-reach and document the benefits (e.g., improved continuity of care, fewer institutional transfers, individuals who are better prepared for next steps upon release, improved connection with reentry partners, improved likelihood of reporting for first appointment).	
Organizational issues		
The use of electronic devices (e.g., tablets) by incarcerated individuals has the potential to support reentry objectives; however, guidance is needed.	• Develop implementation guides and best practices based on agency objectives (e.g., primarily entertainment or programming), the pros and cons of funding models (e.g., the incarcerated individual pays versus the agency pays), and security issues.	1

Table A.2—Continued

Issue or Problem	Associated Need	Tier
Coordination and continuity of care		
Reentry efforts and continuity-of-care objectives are hindered by a lack of coordination, collaboration, and information-sharing among the stakeholders (e.g., courts, corrections agencies, state and local support agencies, nongovernmental organizations).	• Develop implementation guides that highlight effective strategies for obtaining funding to establish (and incentivize participation in) model automated solutions to support coordinated reentry case management across partners. These automated solutions could track and allow partner access to essential and timely information across domains, including information on assessments, case plans, contacts or interactions, program referrals, progress in programming or supervision, status, and outcomes.	1
Equity issues		
Technology to support reentry can be much more effective when it is designed and implemented with inclusivity in mind.	• Develop best practices and effective strategies for ensuring inclusivity; these strategies should account for diversity among both service providers and the target population (e.g., individuals with disabilities, non-English speakers, cultural differences, access to and ability to pay for technology, and other responsivity considerations).	1
Programming		
The educational content available electronically in a correctional setting is often lacking compared with what can be found in the community.	• Explore the feasibility of public-private partnerships to provide incarcerated individuals with free or low-cost offline access to content beyond open educational resources (i.e., the most up-to-date and relevant materials, literature that is relevant and interesting to the population).	2
The use of electronic devices (e.g., tablets, laptops) by incarcerated individuals has the potential to support reentry objectives; however, guidance is needed.	• Research the impact on outcomes of access to electronic devices for communication with prosocial contacts and programming content.	
Transitional services		
Medication-assisted treatment (e.g. suboxone, vivitrol) can help individuals recover from substance use disorders; however, it is underutilized in corrections.	• Develop best practices and effective strategies to expand the use and effectiveness of medication-assisted treatment in conjunction with clinical treatment in facilities and better coordination with outside providers (e.g., instructions on how to access care, reminders) to ensure continuity of care upon release.	2
Returning citizens face challenges obtaining Medicaid and other government benefits in a timely manner, which can lead to negative outcomes and unnecessary expense.	• Develop technology solutions and effective strategies to facilitate the application process so that eligible individuals have critical benefits in place upon release.	
Organizational issues		
Correctional institutions tend to be risk averse and often limit incarcerated individuals' access to modern technology. As a result, these individuals might lack digital literacy or skills, which can be a barrier to reentry.	• Develop best practices and effective strategies to overcome risk aversion to making relevant and up-to-date technology and training more available. Guidance should include implementation issues, such as how to address security concerns by mitigating risk of misuse (e.g., policies, procedures, and filtering and monitoring software; screen mirroring). • Conduct research quantifying the return on investment and benefits of incorporating technology into reentry programming (e.g., impacts on recidivism, employability, idleness, institutional safety), and develop case studies documenting successful implementations.	2
Many facilities lack the IT infrastructure (e.g., WiFi, cellular) to optimize technology to deliver services.	• Develop implementation guides that identify the issues agencies need to consider (e.g., initial costs, ongoing maintenance and upgrades) when retrofitting institutions and/or planning new institution design.	

Table A.2—Continued

Issue or Problem	Associated Need	Tier
Coordination and continuity of care		
Technology can help support a cultural shift in the reentry space and better alignment among partners toward a common goal.	• Create guidelines, case studies, and demonstrations for incorporating expanded goals and metrics for success in reentry (beyond recidivism)—such as quality of service, service delivery with dignity, and client satisfaction—into accountability management systems.	2
Community supervision		
It can be challenging to keep supervisees informed of the reentry services available to them.	• Develop a model resource directory of reentry services and eligibility criteria for each provider and strategies to keep the information up to date. Desired features include accessibility via application on a smartphone, integrated mapping to identify the nearest services and their accessibility via public transit, and the capability to push notifications to enrolled individuals regarding new opportunities (e.g., jobs, housing).	2
Smartphone applications have the potential to improve reentry outcomes in a variety of ways (e.g., automated reminders, positive reinforcements, video connection to officers and resources, remote check-ins).	• Conduct research (or assemble findings) on the impact of these solutions on key outcome measures (e.g., appearance rates, recidivism, desistance, treatment progress, quality of contacts, supervision completion).	
Traditional GPS ankle bracelets and related supervision practices can be stigmatizing and pose a barrier to reentry.	• Assess the suitability of less-stigmatizing location-monitoring approaches for risk-appropriate supervisees, such as smartphone applications or "wearables." Determine impact on outcomes (e.g., violations and recidivism) across populations and operations (e.g., differences in the number of alerts; time and resources needed for installing, inspecting, and managing equipment).	
Restrictions on supervisee use of technology in the community (e.g., sex offender access to computers and the internet) can be a barrier to success.	• Develop best practices, policies, and strategies to guide agencies in effectively managing the risks associated with supervisee access to technology so that public safety and reentry goals can both be achieved.	
Technology can help community supervision staff manage tasks so that they can provide more-meaningful services to supervisees.	• Assess the utility of solutions (e.g., communication platforms, voice-to-text case notes, biometrics or barcode scanners to verify program attendance, automatic route management for managing field contacts) to improve staff efficiencies and reduce workload.	
Programming		
Technology can be leveraged to better prepare incarcerated individuals for job opportunities.	• Conduct demonstration projects and case studies for public-private partnerships that allow individuals to work in tech-related fields while still incarcerated. Explore funding models that return profits to the program (rather than a general fund) so it can be self-sustaining.	3
Technology can play an important role in correctional education.	• Develop case studies, effective strategies, and implementation guides around creating a "campus atmosphere" in a correctional setting while being sensitive to security concerns. Promote awareness of sources of open education resources and explore the pros and cons of various delivery models (e.g., canned content, offline access to internet content, local WiFi hotspots hosting content, private clouds, hybrid models).	
Agencies interested in VR or other simulation tools could face significant barriers to entry (i.e., they might not know where to start).	• Develop a "how to" guide for agencies to get started with the resources available. Guidance should address staffing needs and implications, training needs, equipment needs, IT support, sources of existing content, and how to create original content.	

Table A.2—Continued

Issue or Problem	Associated Need	Tier
Transitional services		
Returning citizens face challenges obtaining Medicaid and other government benefits in a timely manner, which can lead to negative outcomes and unnecessary expense.	• Conduct research quantifying the return on investment of uninterrupted access to care, including measures of quality of life, health outcomes, and other direct and indirect benefits.	3
Organizational issues		
It can be challenging to perform adequate capacity and resource planning for reentry programming.	• Develop and assess tools to track and map service capacity in a given area on an ongoing basis so adjustments can be made. Tools should identify whether service capacity matches the needs of those released, whether services are in areas where individuals will be returning or spending time, and whether public transportation is available to these locations. Where are other resource deserts (e.g., affordable housing, jobs)?	3
It can be challenging for agencies to keep abreast of effective programs and promising practices using technology to support reentry.	• Promote national focal points (e.g., National Reentry Resource Center, National Institution of Corrections) that are responsible for developing case studies; documenting best practices and effective strategies; and facilitating information-sharing among agencies and other stakeholders.	
Coordination and continuity of care		
The use of multiple assessment tools by agencies and service providers can introduce inefficiencies, duplication of effort, lack of continuity of care, and frustration for individuals.	• Assess the viability of common, generic, validated, and gender-sensitive and culturally sensitive assessment or case-planning tools (static, dynamic, protective factors) used by stakeholders in a geographic area or jurisdiction; evaluate the potential impact on quality of service provision and efficiency.	3
Community supervision		
Social media activity can provide important information for supervision agencies to evaluate a supervisee's prosocial or antisocial contacts and influences.	• Create strategies, policies, and tools (e.g., web crawlers) to support effective monitoring.	3
Smartphone applications can help those on community supervision or in residential facilities; however, some cannot afford a device and/or monthly plan payments.	• Explore such strategies as public-private partnerships with cellular providers to give free or low-cost devices and services to returning citizens and maximize the use of the Federal Communications Commission's Lifeline program.	
It can be challenging to evaluate the variety of smartphone applications available for corrections.	• Create resources, including (1) a market survey of smartphone applications highlighting key metrics, such as features, capabilities, limitations, and cost; and (2) implementation guides to provide agencies with information and lessons learned from current users.	
Technology can enable place-based supervision, but some agencies struggle to implement this model.	• Create resource materials, such as best practices, implementation guides, cost/benefit analyses, and outcome data on the efficacy of the place-based supervision model, including the IT infrastructure needed to support a mobile workforce (e.g., web-based case-management systems, connectivity, laptops, tablets, printers, electronic signature systems, body-worn cameras).	
It can be challenging to identify all the prosocial and antisocial influences (particularly as cases shift from officer to officer, incarceration to community to service provider, etc.).	• Develop an eco-map (e.g., social network analysis) and management system for identifying prosocial and antisocial individuals and influences in a supervisee's life.	

Table A.2—Continued

Issue or Problem	Associated Need	Tier
Equity issues		
There is an opportunity to leverage technology to enhance procedural justice objectives.	• Examine the viability of applications or platforms that allow individuals to view their state or local criminal case history (e.g., open cases, warrants) so they can work on resolution; provide clarity on what happens at each stage of the process and why (e.g., rights, expectations, access to advocates); and provide easy access to applications for expungement, early termination of supervision, and/or other relief as allowable.	3

Note

[1] In this report, the term *virtual reality* refers generally to a category of technologies that allow an individual to experience their presence in an immersive, digitally rendered environment.

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Justice Policy Program

RAND Social and Economic Well-Being is a division of the RAND Corporation that seeks to actively improve the health and social and economic well-being of populations and communities throughout the world. This research was conducted in the Justice Policy Program within RAND Social and Economic Well-Being. The program focuses on such topics as access to justice, policing, corrections, drug policy, and court system reform, as well as other policy concerns pertaining to public safety and criminal and civil justice. For more information, email justicepolicy@rand.org.

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About This Report

On behalf of the U.S. Department of Justice, National Institute of Justice, the RAND Corporation, in partnership with the Police Executive Research Forum, RTI International, and the University of Denver, is carrying out a research effort to assess and prioritize technology and related needs across the criminal justice community. This research effort, called the Priority Criminal Justice Needs Initiative (PCJNI), is a component of the Criminal Justice Requirements and Resources Consortium (RRC) and is intended to support innovation within the criminal justice enterprise. For more information about the RRC and the PCJNI, please see www.rand.org/well-being/justice-policy/projects/priority-criminal-justice-needs.

This report is one product of that effort. In March 2021, RAND Corporation researchers and University of Denver staff conducted an expert workshop on leveraging technology to support prisoner reentry. The workshop was convened to identify high-priority technology needs for improving reentry outcomes. This report presents the proceedings of that workshop, topics considered, needs that the workshop participants developed, and overarching themes that emerged from the discussion. This report should be of interest to correctional administrators, reentry services providers, technology providers, and the research community. Other RAND research reports from the PCJNI that might be of interest are

- Joe Russo, Michael J. D. Vermeer, Dulani Woods, and Brian A. Jackson, *Community Supervision in a Digital World: Challenges and Opportunities*, Santa Monica, Calif.: RAND Corporation, RR-A108-10, 2021
- Joe Russo, Dulani Woods, George B. Drake, and Brian A. Jackson, *Leveraging Technology to Enhance Community Supervision: Identifying Needs to Address Current and Emerging Concerns*, Santa Monica, Calif.: RAND Corporation, RR-3213-NIJ, 2019
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