Monitoring Technologies
for Community Supervision

This technology brief is the first document in a four-part series (**Figure 1**) on technologies to support the monitoring and supervision of individuals on pretrial release, probation, and parole (i.e., community supervision). The goal of this series is to offer foundational insights from use cases, examine the challenges of community supervision, highlight example products, and discuss the future of select technologies and their implications for community supervision. This brief provides an overview of select types of technologies used to enhance supervision of individuals in the community, including tracking their locations, detecting drug and alcohol use, and leveraging smartphone applications.[1]

Key Takeaways

- Challenges to community supervision, including high-volume caseloads, budget constraints, and complexities due to COVID-19 , are driving interest in technologies, including emerging location tracking systems (LTS), substance use monitoring solutions, and smartphone applications.

- Implementing supervision technologies should align with evidence-based practices; correspond to the risk level and needs of the person on community supervision; consider supervision goals and case management strategy; and, whenever possible, incorporate positive reinforcements for patterns of compliance.

- Effective implementation of new technologies must consider efficacy, burden, access, and costs for both supervision agencies and the individuals on community supervision.

- Supervision technologies are tools with advantages and limitations, not a single solution to supervision challenges. New technologies do not necessarily create improved outcomes.

Community supervision agencies face increasing challenges in both monitoring and supporting individuals on community supervision. Resource limitations, high-volume caseloads, and staff capacity present persistent challenges to supervision. In addition, COVID-19 created new complexities like social distancing. At the same time, there is increasing interest in reducing the burdens on monitored individuals and shifting community supervision to a more proactive and supportive approach. These factors are driving interest in using novel technologies to enhance community supervision.[2,3] This brief begins with relevant context and trends within community supervision, followed by technology insights for three supervision technologies—location tracking systems (LTS), alcohol and drug monitoring solutions, and smartphone applications. Each technology is explored in-depth in a subsequent brief in this series. This brief concludes with implementation considerations intended to support decisions by courts and supervision agencies. Inclusion of a product in this report does not represent a recommendation, endorsement, or validation of product claims by the Department of Justice, National Institute of Justice, RTI International, or CJTEC.

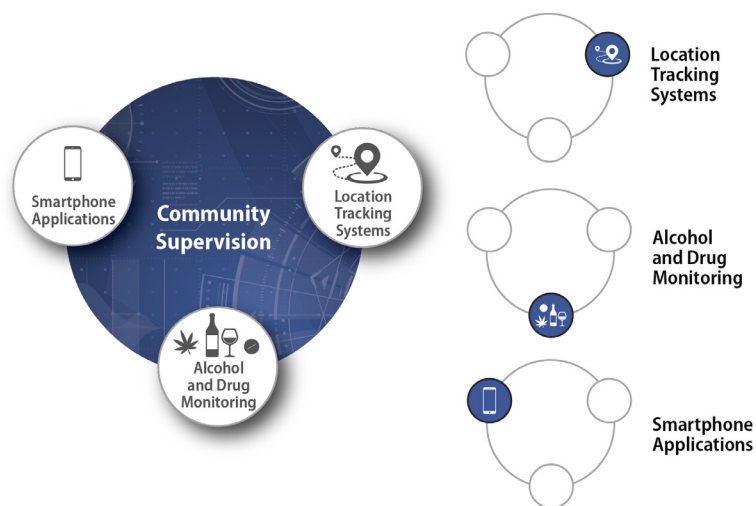### Technologies to Enhance Community Supervision

Figure 1: This brief is the first in a four-part series that provides an overview of technologies to support community supervision. Additional briefs include detailed research on location tracking systems, alcohol and drug monitoring solutions, and smartphone applications.

An Introduction to Community Supervision

Community supervision, also commonly referred to as community corrections, includes a range of supervision models in which individuals are subject to supervision requirements while remaining in the community. Release to the community can include conditions such as participating in drug treatment programs, obtaining mental health evaluations or treatment, maintaining employment, avoiding contact with victims, and attending other scheduled meetings or activities. Community supervision can take many forms, but the three most common are pretrial supervision, probation, and parole (**Figure 2**).[4]

Common Types of Community Supervision		
Pretrial Release	**Probation**	**Parole**
Pretrial release refers to individuals who have been charged with a crime and are released on bond to the community while awaiting trial.[5] The decision to release the pretrial defendant is made by the judge or judicial official assigned to the case, taking into consideration various factors. This may include assessing the overall risks and needs associated with ensuring the defendant's presence at future court proceedings, ensuring the safety of the community, and protecting the well-being of victims and witnesses involved in the case.[6] Pretrial supervision describes the set of conditions associated with the release, which outline specific expectations and behaviors for individuals released on bond. These conditions may include prohibitions on possessing firearms and weapons, restrictions on contacting victims or witnesses, limitations on travel, and curfew requirements.[7]	Probation refers to adults who have been convicted of a crime that courts place on community supervision through a probation agency, usually in lieu of incarceration. However, sometimes jurisdictions sentence probationers to short-term sentences followed by probation. Individuals on probation are typically required to fulfill certain conditions of their supervision and adhere to specific rules of conduct in their community.[8] Conditions can include being employed or attending school, obtaining travel permissions, submitting to searches or testing, avoiding association with certain persons, meeting with the supervisory probation officer, and participating in drug treatment or other counseling programs. It can also include special conditions related specifically to the crime committed, for example, installation of ignition interlock breathalyzers for individuals charged with driving under the influence/driving while intoxicated (DUI/DWI), specific treatment programs for sex offenders, or restricted proximity to victims in cases of domestic violence.[9]	Parole refers to individuals convicted of a crime who are conditionally released from prison to serve the remaining portion of their sentence in the community. An individual may be released on parole for several reasons, including discretionary release by the parole board and mandatory release according to provisions of a statute.[8] Individuals on parole supervision are often subject to conditions of release that are very similar to those of probation (e.g., attending regular meetings with the parole officer, obtaining permission to move or change employment, adhering to a prohibition on having weapons).

Figure 2: Community supervision includes a range of models in which individuals are subjected to certain requirements while remaining in the community.

Community Supervision by the Numbers

At the end of 2021, nearly 3 million people were under probation supervision, and approximately 800,000 were reported to be under parole supervision. Over the last decade, the number of individuals on probation has gradually decreased, while the parole population has remained relatively stable. However, the most recent Bureau of Justice Statistics (BJS) yearly statistics show a 7% decrease in the parole population from 2020 to 2021, the largest recorded decrease since 1980.[10] Currently, no studies accurately estimate the number of individuals on pretrial release.

Approximately 68% of persons (3,745,000) supervised by adult correctional systems in the United States were on community supervision at the end of 2021, whereas about 32% (1,775,300) were incarcerated in a state or federal prison or local jail.[11,12]

Challenges in Community Supervision

As corrections agencies grapple with persistent challenges and new complexities as a result of COVID-19, interest in technologies to support both supervision officers and individuals on community supervision is increasing.[3,13]

Resource limitations, high-volume caseloads, and staffing challenges create demand for technology solutions that can increase operational efficiency, help agencies do more with less, and relieve officer stress/burden. Costs of community supervision programs and funding rise to the top of many agencies' lists of challenges and needs. High-volume caseloads and limited staffing place high demands on officers and the jobs they do, including the supervision and monitoring of individuals on community supervision. Additionally, many agency directors have reported that they are actively experiencing or anticipating pandemic-driven budget crises.[13]

More recent shifts in the roles of supervision officers from "referee" to "coach" have created increased interest in technologies like smartphone applications that can integrate access to resources, prosocial interventions, rewards, and behavioral "nudges."[14,15] Recent efforts have focused on engaging and supporting the individual on community supervision in a proactive or self-guided manner that can help promote success and prevent missteps rather than strictly monitoring for violations and new crimes.[16]

The challenges of complying with supervision requirements create interest in technology solutions that reduce the burden on individuals on community supervision. Individuals on community supervision must meet the conditional supervision requirements to avoid further penalty. Depending on the conditions imposed, individuals may often pay fees, travel to various appointments, and participate in drug testing while trying to develop and maintain a functioning work and family life. These challenges can result in high failure rates.[17] Emerging technologies for remote substance use monitoring and remote check-ins can reduce travel requirements for individuals on community supervision. New LTS, such as wrist-worn trackers, are smaller and lighter than ankle-worn LTS, which may reduce stigma. Policy changes and technology advances can reduce supervision costs/fees.

Racial and economic disparities create interest in technologies that drive more fair outcomes. The most recent data available highlight that people of color, particularly Black Americans, are disproportionately represented in the community supervision population. In 2021, 30% of adults on probation with a known race or ethnicity were Black, and 37% of adults on parole were Black.[10] However, according to the 2021 census data, Black individuals represented only 14% of the total national population.[18] These disparities can have broad consequences, including impacts on the health and functioning of minority communities, and can raise questions related to the legitimacy of the criminal justice system.[19] Reducing racial disparities in technical violations is recognized as a priority need within community supervision.[20] Additionally, fees associated with supervision can create challenges for low-income individuals.[21] Reform efforts attempt to eliminate or individualize supervision fees in ways that enable successful reentry.[22] Many technologies tend to be digital in nature, and this is no different for technologies used for community supervision services. For example, households with internet access have a greater advantage in using digital technologies for community supervision relative to households with no internet access.

The COVID-19 pandemic increased interest in technologies to enhance/enable remote monitoring and supervision. Perhaps the most significant impacts on supervision agencies over the past few years have resulted from the COVID-19 pandemic:[23,24]

- Many judges and correctional agencies sought early release or alternatives to incarceration to attempt to contain infections.[25,26,27] For example, between March and June 2020, more than 100,000 people were released from state and federal prisons.[28]

- Probation and parole agencies modified their policies and curtailed the use of incarceration in response to technical violations, opting to keep individuals in the community with additional sanctions such as location tracking.[29]

- Additional layers of complexity to in-person supervision, such as check-ins and face-to-face meetings, surfaced because of social distancing requirements and concerns about COVID-19 transmission.

- As court systems shut down during the pandemic, many jurisdictions experienced significant case backlogs. As a result, individuals under pretrial supervision have been monitored for longer periods than normal as the courts struggle to catch up. To illustrate the impact, the number of individuals supervised with LTS by Harris County Pretrial Services (Houston, Texas) grew from 27 cases in 2019 to more than 4,000 as of late 2021.[30]

- Agency directors cited the inability to hold individuals on supervision accountable as a result of court case backlogs, difficulty in obtaining/inability to obtain arrest warrants, and the limited ability to use jails for probation violations as key challenges during the COVID-19 pandemic.[13]

"In place of this face-to-face contact, agencies reported a large increase in the use of technology (e.g., telephone calls, video conferencing, e-mail, and texting) to supervise caseloads. … The use of technology allowed agencies to prioritize the health and safety of their staff and clients and has removed some traditional barriers for individuals on supervision, including transportation and flexibility to meet with their officers around their work schedules. Despite these reported benefits, there is scant empirical evidence regarding the implementation and effectiveness of teleconferencing for community supervision. … A critical path forward for future research is to examine the implementation of technologies to supervise individuals and provide support and a range of services."[13]

Technologies for Enhancing Community Supervision

Informed by the new complexities, persistent challenges, and priority needs within community supervision, this technology brief series focuses on new technologies for location tracking, solutions for alcohol and drug monitoring, and the emerging use of smartphone apps in community supervision.

Location Tracking

Advances in enabling technologies are driving new and improved capabilities in LTS, but research into the evidence-based best practices and potential unintended consequences of LTS expansion has not kept pace.

Note: LTS are explored in-depth in a separate brief in this series: https://cjttec.org/location-tracking-systems-for-community-supervision/.

Tracking the location of individuals on pretrial release, probation, or parole can be an important component of community supervision. As a condition of their release, individuals may be restricted to home confinement, required to stay away from certain locations (e.g., victim's house), or required to be at certain locations during parts of the day (e.g., school, work). LTS come in multiple form factors, including one-piece systems, two-piece systems, and smartphone applications (**Figure 3**).
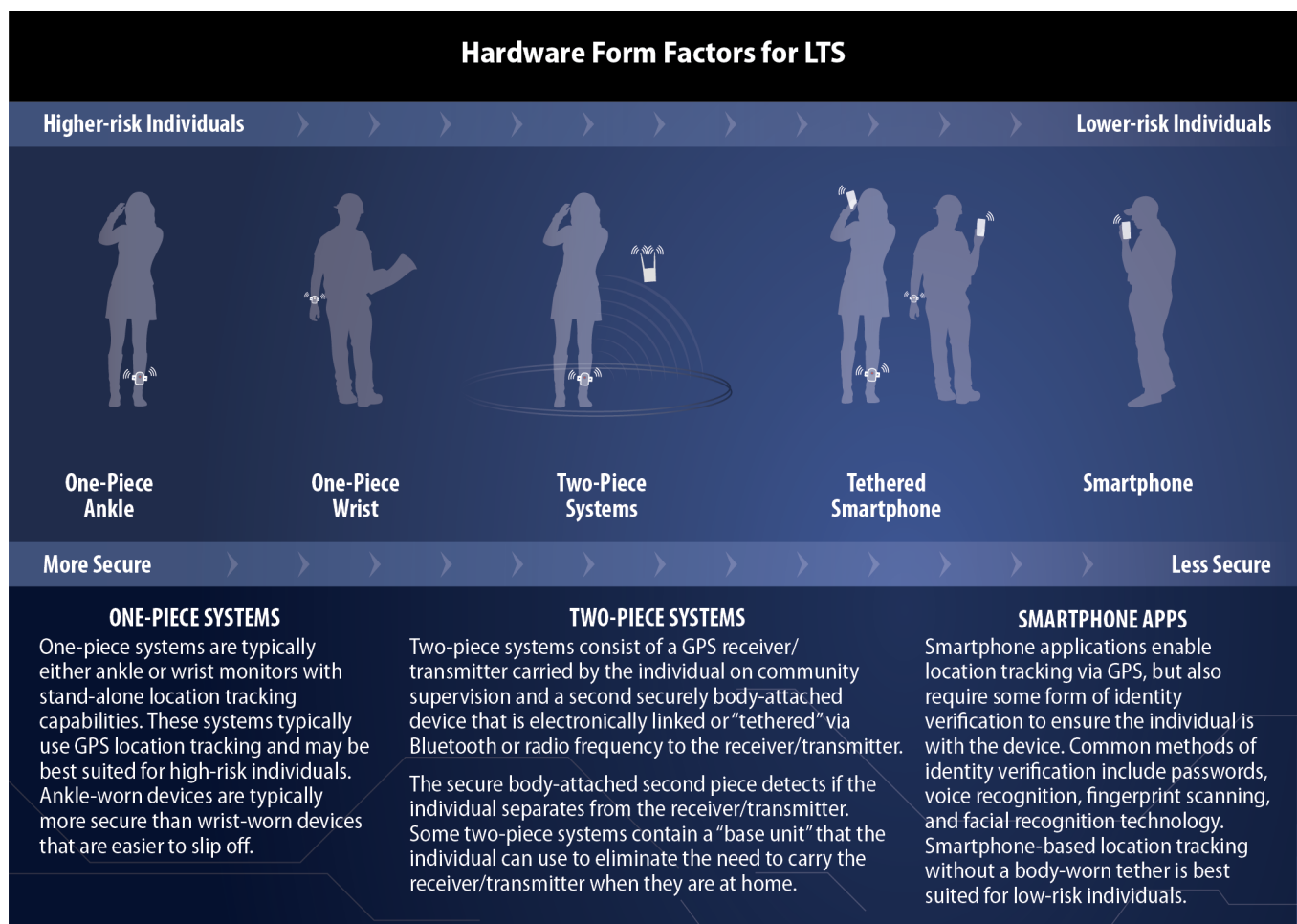

Hardware Form Factors for LTS

Higher-risk Individuals   Lower-risk Individuals

One-Piece Ankle | One-Piece Wrist | Two-Piece Systems | Tethered Smartphone | Smartphone

More Secure   Less Secure

ONE-PIECE SYSTEMS

One-piece systems are typically either ankle or wrist monitors with stand-alone location tracking capabilities. These systems typically use GPS location tracking and may be best suited for high-risk individuals. Ankle-worn devices are typically more secure than wrist-worn devices that are easier to slip off.

TWO-PIECE SYSTEMS

Two-piece systems consist of a GPS receiver/transmitter carried by the individual on community supervision and a second securely body-attached device that is electronically linked or "tethered" via Bluetooth or radio frequency to the receiver/transmitter.

The secure body-attached second piece detects if the individual separates from the receiver/transmitter. Some two-piece systems contain a "base unit" that the individual can use to eliminate the need to carry the receiver/transmitter when they are at home.

SMARTPHONE APPS

Smartphone applications enable location tracking via GPS, but also require some form of identity verification to ensure the individual is with the device. Common methods of identity verification include passwords, voice recognition, fingerprint scanning, and facial recognition technology. Smartphone-based location tracking without a body-worn tether is best suited for low-risk individuals.

Figure 3: Technologies enabling location tracking can combine with different system features and capabilities to accommodate various risk levels.

LTS comprise hardware and software technologies that enable simultaneous location, time, and identity verification. Tracking receivers determine an individual's location using **radio frequency**, **Global Positioning System (GPS)**, **Wi-Fi**, or **cell tower triangulation**, and associated **software systems** map and monitor an individual's movements into or out of specific areas (**Figure 4**).

As technologies are developed or improved for other consumer applications, they create technological tailwinds for LTS capabilities. Advances in 5G and other **cellular connectivity technologies**, increases in **battery capacity**, new **charging system designs**, **hardware miniaturization**, and enhanced **power management strategies** that were first developed for other consumer products are being incorporated into new LTS. Such advances enable new location tracking and features and form factors like one-piece, wrist-worn monitors and smartphone-enabled systems. These newer technology form factors may reduce stigma and include additional communication capabilities, but they still have challenges related to security and battery life.

Methods for Location Tracking in Community Supervision

Location tracking is enabled by a variety of technologies that are often used in combination to create a full location tracking system

Global Positioning System (GPS)
GPS uses a system of navigation satellites. Receivers in body-worn devices or in a smartphone convey location via signals sent to and from the satellites calculating the position of the receiver. GPS can be used to track an individual on community supervision over a large area and can be integrated into body-worn devices or used as part of a cell phone system.

Wi-Fi
Wi-Fi access points can be used to verify that a device is within geographic range of the Wi-Fi network and establish device location. This method can be useful in locations with limited GPS or cellular coverage (e.g., urban canyons, subway systems, rural areas).

Cell Tower
Cell tower triangulation can be used to locate a device. Cell towers are also critical for transmitting GPS data.

Radio Frequency (RF)
Some LTS use short-range (50 ft–150 ft) radio frequencies to communicate between body-attached devices and receiver/transmitters (RF beacons). These RF beacons can be placed in a limited number of fixed locations (e.g., home, work) primarily to conserve battery life of GPS tracking devices.

Data Monitoring Centers
Data from LTS are sent via the internet or cellular communications to data centers, usually maintained by LTS vendors.

Supervising Agency
The supervision agency receives alerts and notifications from data monitoring centers when violations occur.

Software and Analytics
Vendor-provided software platforms enable analytics and data visualizations to support monitoring and supervision activities.

Figure 4: LTS use various technologies to determine the location of a monitored individual and transmit that information to supervision officers.

LTS Trends

Use of LTS is growing. Although rigorous data on the exact number of individuals using LTS does not exist, experts and practitioners point to several major societal and policy shifts that have converged to contribute to accelerated growth, including the COVID-19 pandemic, court case backlogs, bail reform, and interest in alternatives to incarceration.[31,32]

Enabling technologies are advancing. Improvements in consumer electronics are enabling advances in location accuracy and reliability. Hardware miniaturization is creating smaller, less stigmatizing form factors. Improvements in charging technology, battery capacity, and power management are enabling faster charging and longer battery life. Sensors and analytics are improving tamper resistance, tamper detection, and signal interference. These enabling technologies are enhancing user experience. At the same time, technology is also making possible circumvention techniques (e.g., artificial intelligence [AI]-enabled location spoofing).

Agencies have more options for various risk profiles. The range of LTS options and features continues to expand, including wrist-worn trackers and smartphone-based systems. Agencies have greater flexibility to match the type of technology deployed with the risk level and supervision goals of the person on community supervision. For example, agencies are exploring ways to leverage smartphone apps to efficiently supervise lower-risk individuals without the stigmatizing effects of traditional LTS. Furthermore, smartphone apps can provide access to additional resources for individuals on community supervision and enable proximity notification for victims.

Implementation challenges remain. Funding limitations and workforce/workload constraints present critical challenges to effective LTS training and implementation.

Key Insights

LTS are not a complete solution, but rather a tool to support effective supervision. The use of LTS must align with case management strategy, supervision goals, and evidence-based practice. Agencies should avoid a "one-size-fits-all" approach.

The choice of an LTS should consider more than just features and cost. Risk level and supervision should play a key role in determining the optimal LTS, and LTS are not appropriate in every case. When making technology choices, there must be a balance between what is technically possible, operationally practical, fair, and ethical to produce desired supervision outcomes.

LTS often create more work, not less. The use of LTS often increases workloads for supervision officers because they need to respond to alerts and violations, periodically inspect equipment for tamper indications, and analyze location data to inform case management. As the use of LTS grows, workloads for already strained supervision officers could increase.

Technology development is outpacing research. Research to understand the effects of LTS on supervision goals, the unintended consequences, and implementation best practices is needed to create evidence-informed policies and practices. The current body of research about LTS effectiveness for reducing recidivism shows mixed results. More research is needed to evaluate both traditional and newer forms of LTS (e.g., wrist-worn devices and smartphone systems) and their impacts on a broad set of supervision metrics.

Substance Use Monitoring—Alcohol Monitoring

The miniaturization of breath testing devices and transdermal alcohol monitoring devices have enabled remote solutions for alcohol monitoring.

Note: Alcohol monitoring is explored in-depth in a subsequent brief in this series: https://cjttec.org/alcohol-and-drug-monitoring-for-community-supervision/.

In the context of community supervision, alcohol monitoring refers to the process of regularly testing a person for alcohol to verify sobriety. Requiring persons to abstain from alcohol or excessive alcohol use is common for individuals on community supervision. This is particularly true for persons involved in alcohol-related offenses, such as those charged with or convicted of DUI or DWI. Several technologies are available to assist with alcohol monitoring. Most of these technologies detect alcohol through breath samples, but sweat is also used. Furthermore, these technologies vary on where the alcohol monitoring can be done. On-site monitoring technologies refer to devices that require the individual on community supervision to report to a designated location for monitoring. Technologies that enable remote monitoring can be self-administered from the individual on community supervision's home, workplace, or other location and, thus, do not require interaction between a supervision officer and the individual on community supervision.

Type of Technology	Definition	Collection Location		Sample Type	
		On Site	Remote	Breath	Sweat
Preliminary Breath Test (PBT) devices are handheld breath alcohol testing instruments used to determine the presence of alcohol. The frequency with which a person on community supervision needs to report for a breath test varies depending on the individual's condition of supervision and risk level.		X		X	
Kiosks are a device, typically a computer or an ATM-like machine, used by individuals on community supervision to report to their supervision officer instead of having face-to-face meetings with them.[33] Some kiosks have the added ability to monitor alcohol. These kiosks are equipped to conduct PBTs. An individual inserts a disposable straw mouthpiece into the device and blows into it to provide a breath sample.		X		X	
Ignition Interlock Devices (IID) are small handheld and portable analyzing devices for car ignitions that are installed to prevent users from starting their vehicle after drinking alcohol.			X	X	
Portable Alcohol Monitoring (PAM) Devices are handheld, one-piece, breathalyzer devices that enable an individual to self-monitor their breath alcohol concentration remotely in low-risk environments. These devices use fuel cell technology, which employs a process that oxidizes the alcohol in a breath sample, producing an electrical current that the device measures to determine the blood alcohol content.			X	X	
Transdermal Alcohol Monitoring (TAM) Devices capture transdermal alcohol readings from insensible perspiration (vaporous sweat) excreted through the skin to continuously monitor alcohol use.[34]			X		X

Substance Use Monitoring—Drug Monitoring

Alternative specimens and testing approaches drive innovation in drug monitoring; however, the technologies that can rapidly and remotely monitor individuals for drug use are limited.

Note: Drug monitoring is explored in-depth in a subsequent brief in this series: https://cjttec.org/alcohol-and-drug-monitoring-for-community-supervision/.

Drug monitoring involves regularly testing an individual for controlled and noncontrolled substances to verify sobriety while under community supervision. Individuals on community supervision are often subject to drug testing with the goal of deterring use and reducing criminal reoffending. The technology behind collection and testing of drug samples has largely remained the same. Drug testing strategies can vary significantly across agencies. Various specimens can be collected and tested for drugs using different approaches (**Figure 5**).

Drug Monitoring Solutions

SPECIMENS FOR DRUG MONITORING
Although urine remains the standard for drug monitoring, agencies can collect alternative biological specimens that may contain traces of drugs or their metabolites.

Hair Follicle
Oral Fluid
Blood
Sweat
Urine

APPROACHES TO DRUG MONITORING
Agencies can conduct testing in-house or with the help of a contracted agency; they can employ different types of test.

In-House Testing
Specimen is collected by supervising agency and sent to lab if confirmation is needed.

Contracted Testing
Specimen is collected by a third-party drug testing service.

TYPES OF TESTS

Point-of-Care Test (screening)

Laboratory Test (confirmatory)

Figure 5: Community supervision agencies can collect various specimens for testing individuals for drug use.

Agencies can collect and send samples for testing themselves or engage with a contracted testing firm that handles collection and testing. They can use **point-of-care tests** that provide rapid, on-site results or confirmatory **laboratory tests** that provide a more comprehensive, accurate result.

Type of Technology	Advantages	Disadvantages
Point-of-Care Tests	▪ Timely results (in minutes) ▪ Cost per test lower than that of laboratory testing ▪ Minimal training required by the supervision agency to use the test	▪ Qualitative not quantitative (provides a positive or negative) ▪ Lower specificity and sensitivity than laboratory tests ▪ Results generally recorded manually at the time the test is conducted, leaving room for human errors
Laboratory Tests	▪ Quantitative information provided on what drugs are detected ▪ Tests performed by trained laboratory in accredited laboratories ▪ Confirmatory tests may detect a wider range of drugs ▪ Improved sensitivity and specificity (fewer false positives and negatives) ▪ Collection and testing processed with a chain-of-custody	▪ Long turnaround time compared with point-of-care tests; results not "instant" ▪ Cost per test high compared with point-of-care tests

Alcohol Monitoring Insights

Transdermal alcohol monitoring using wearables will likely be the future of alcohol monitoring. This insight is driven by trends in technology miniaturization and wearables, as well as the desire for more discrete monitoring solutions. Several companies are in the process of bringing to market wrist-worn alcohol monitoring solutions.[35]

The use of remote alcohol monitoring solutions provides benefits to both the supervision agency and the individual on community supervision. For example, remote alcohol monitoring enables individuals on community supervision to maintain family obligations and employment with limited disruption and helps supervision officers manage their caseloads by allowing them to devote more attention to individuals considered high risk.

24/7 sobriety programs,[36] which typically use twice-daily breath tests for alcohol monitoring, have come under scrutiny when applied to individuals on pretrial release. This type of monitoring has been subject to recent lawsuits arguing unreasonable searches and seizures, depriving participants of liberty through repeated pretrial arrests without due process, and depriving participants of reasonable bail conditions.

Drug Monitoring Insights

Urinalysis is considered the standard for drug monitoring, but the use of alternative specimens is growing. Urinalysis remains the preferred testing methodology because larger volumes can be collected, parent drug and metabolites are present in high concentrations, tests are less expensive and complex, and it predominates community supervision state statutory requirements. Advances in drug testing technology have enabled agencies to test oral fluid, hair, sweat, and other specimens. Collecting these specimens may be less invasive than collecting urine and require less stringent collection circumstances. With different windows of detection, these specimens may also provide information on drug use over a long or short time frame (minutes to days).

Innovation in drug monitoring is hindered by technological limitations, such as the ability to test for multiple substances, and logistical challenges, such as issues with chain of custody. Biological samples cannot provide the supervision agency with additional information such as how often the individual on community supervision used the drug or how much of the drug they consumed. Even in specimens with short windows of detection (e.g., oral fluid), presence of a drug does not directly correlate with the level of impairment of an individual. Depending on the cutoff concentration of the drug test used and the frequency of testing, an individual may not be using enough of a drug to be detected by the test. The drug landscape is constantly evolving, making it difficult to develop standardized and accepted test methods.

Challenges of the COVID-19 pandemic drove the use of alternative specimens and temporary supervised specimen collection via telecommunication. Some agencies opted for oral fluid and sweat patch testing over urine testing, while other agencies opted to stop testing altogether to avoid close contact between individuals on community supervision and officers. Video-based communication, through platforms like Zoom, enabled proctored virtual drug testing of oral fluid. This innovative testing method, however, poses chain-of-custody challenges and may not be admissible in court.

Smartphone Supervision Applications

Smartphone capabilities are providing the foundation for the development of community supervision apps that can authenticate an individual's identity, provide communication channels for the supervision officer and the individual on community supervision, and track the location of an individual.

Note: Smartphone apps are explored in-depth in a subsequent brief in this series: https://cjttec.org/smartphone-applications-for-community-supervision/.

Community supervision apps are case management and monitoring software tools that can support a wide variety of supervision objectives. These apps provide a myriad of advantages for both the individual on community supervision and the supervision officer, but they also pose some concerns, as seen in **Figure 6**.

Advantages and Limitations of Community Supervision Apps

Potential Advantages to the Supervision Officer and Agency

Community supervision smartphone apps can …

- Support case management by acting as a one-stop shop for supervision officers to access important information, including appointments, treatment plans, attendance records, and compliance information.
- Improve communications with individuals on community supervision through text, email, and video capabilities.
- Improve officer efficiency and reduce workload by enabling remote supervision and enhancing case management.
- Improve officer safety by reducing the need for field visits (e.g., home visits, work sites).
- Provide access to real-time data analytics to support operational efficiency.

Potential Advantages to the Individual on Community Supervision

Community supervision smartphone apps can …

- Increase access to on-demand resources (e.g., case information, local support resources, on-demand educational programming).
- Improve communications with supervision officers through text, email, and video capabilities.
- Reduce travel time to report for in-person meetings, enabling individuals to maintain family obligations and employment with limited interruption.
- Decrease the stigma associated with traditional LTS systems.
- Improve compliance and reduce failures to appear through appointment reminders and other nudges to support behavioral changes.

Potential Limitations and Concerns

- The continual tracking of and the ability to communicate instantly with an individual on community supervision 24/7 may be considered an invasion of privacy.
- There are inherent risks of overusing the monitoring and surveillance features of these apps for individuals who would otherwise not be tracked.
- The use of any technology, including supervision apps, requires appropriate training for both the agency and the individual on community supervision.
- The apps could experience technical issues, which could lead to false alerts or inaccurate data collection.
- Poor access to cellular communications or other connections to the internet may impede the use of apps.
- The digital divide and issues of technology literacy may pose challenges for individuals post-incarceration, especially those who are older and have been incarcerated for a long period of time.
- Little research has been done to date on the impact of community supervision apps on reducing recidivism and supporting supervision goals.
- The cost of the smartphone and the associated data plans necessary for the apps could be cost prohibitive for some, thus limiting who is eligible to participate, raising concerns about equity.
- The use of a supervision app may provide an additional burden to supervision officers if agency policy prohibits integration with existing case management systems, requiring the double entering of data.
- The use of a supervision app inherently collects more information than traditional supervision approaches, which could lead to an increased volume of alerts and notifications, thus potentially increasing the workload of supervision officers and technical violations for individuals on community supervision.

Figure 6: Community supervision apps may provide a more efficient experience for both the individual on community supervision and the supervision officer but can also lead to instances of oversupervision for low-risk individuals.

Community supervision apps may have a variety of functionalities to support both the individuals on community supervision and the supervision officers. Community supervision apps can support accountability objectives by leveraging features such as location monitoring, substance use testing and monitoring, and remote reporting and check-ins. Moreover, community supervision apps can help with behavioral change objectives by serving as a mechanism for delivering treatment programs and resources, transmitting informational content and behavioral nudges (e.g., appointment reminders), and facilitating rewards/incentives for meeting certain milestones. **Figure 7** provides a summary of common functionalities of community supervision apps.[37]

Functionalities of Community Supervision Apps

Most community supervision apps have a **remote reporting** functionality, allowing individuals to submit reports/updates and check-in virtually with their supervision officer.

Some community supervision apps offer **goal setting and reward** features designed to engage and motivate individuals on supervision to set personal goals for self-improvement and compliance.

Community supervision apps support multimodal **communications** (e.g., two-way text messaging, voice, video conferencing) between supervision officers and individuals on community supervision.

Community supervision apps often include a service provider **resource directory** that hosts a database of resources relevant to the individual on community supervision, such as local Alcoholics Anonymous meetings, emergency shelters, and employment services.

Typically, community supervision apps provide **calendar event management and reminders** to notify individuals of important obligations, such as court appearances, drug tests, and counseling appointments.

Some community supervision apps support **substance use testing and management** through remote breath alcohol testing or through the use of algorithms to randomize drug testing schedules.

Community supervision apps can offer improved **service delivery** by supporting video conferencing with treatment providers and by remotely connecting individuals on community supervision to services, including behavioral health services and educational services.

Community supervision apps may offer **location monitoring** features such as tracking the location of the device, creating inclusion and exclusion zones, establishing and monitoring curfews, and generating alerts in the event of a violation.

Community supervision apps may provide customized **data analytics** to agencies such as dashboards for supervision officers to support the management of caseloads and agency-wide use of information.

Figure 7: Community supervision apps have multiple functionalities to support individuals on community supervision and supervision officers.

Community Supervision Apps Trends

COVID-19 accelerated the adoption of community supervision apps. Although some agencies were using supervision apps before the pandemic, the associated social distancing restrictions created a greater need for remote tools. As agencies were forced to limit or even suspend in-person contact with individuals on supervision, supervision apps became an attractive option, allowing for the provision of a wide range of services without the need to meet in-person.[38]

The capabilities of smartphones are advancing, enabling more supervision features. Consumer markets create new smartphone capabilities while driving prices down. Smartphone improvements will likely enable new community supervision application capabilities at lower costs. Key smartphone features allow community supervision applications to authenticate individuals' identity, facilitate communication between supervision officers and individuals on community supervision, and verify the location of the smartphone.

Consolidation of vendors will likely continue. The current market is dominated by small vendors. As agencies continue to adopt these apps and see value in integrating them with their case management systems (CMSs), it is likely that the larger CMS vendors will develop their own tools or acquire smaller companies and integrate them into their CMS.

AI and improvements in sensors may redefine future capabilities of community supervision apps. Researchers are investigating how to use AI and smartphone sensors to predict behavioral tendencies.[39] Although likely far in the future, the ability to detect and predict behavioral tendencies could contribute to innovations in the development of smartphone apps for individuals on community supervision. For instance, if AI can predict a stressful situation, a smartphone app could help the individual by automating the delivery of helpful resources.

Key Insights

When implementing a supervision app, agencies need to identify the target population and determine their goals. Some agencies may wish to use apps as a support tool for individuals on community supervision, while other agencies may want to use an app to ensure individuals are complying with their conditions of release. The purpose will ultimately determine which functionalities are needed and will ascertain which app is right for the agency.

Supervision agencies implementing an app need to consider the app's integration with the agency's current CMS and their policies on data sharing. An app may be able to support complete data integration or one-way data integration or may not be able to support data integration at all. Integration depends on two factors: 1) whether the current CMS has the technical capability to connect to a cloud platform and 2) an agency's data-sharing policy. Full data integration enables more efficient and accurate case management because it limits the need to double-enter data, thus reducing any potential data entry issues.

Despite data integration challenges, community supervision apps are still being adopted because they increase efficiency for supervision officers. Supervision apps can act as a one-stop shop for supervision officers to access important information like appointments, treatment plans, and attendance records, which can enhance operational efficiency. Many community supervision apps have interfaces that are similar to other smartphone apps, shortening learning curves and increasing usability.

Data analytics capabilities of community supervision apps are beneficial to both the agency and the supervision officer. Data analytics generated from apps can operationally support agencies with customizable real-time reports such as overall agency compliance, number of users, negative substance tests, and supervision officers' caseloads. Similarly, dashboards help supervision officers see individual case information and alerts.

More research is needed to understand the effectiveness of community supervision apps. Little research has been done on the impact of community supervision apps on reducing recidivism and supporting supervision goals.

Considerations for Implementing Community Supervision Technologies

Community supervision agencies deliberating the implementation of technologies to enhance operations must think about practical considerations, which include agency priorities balanced with risk level; technical considerations, which include both technology realities and legal precedents; and ethical considerations, which take into account the risks of monitoring for the person on community supervision.

Practical Considerations

Before implementing supervision technology, agencies should be clear about the specific need(s) the technology-based solution is attempting to address. Agencies may seek to address multiple purposes; however, a thorough and objective needs assessment can help agencies better identify and articulate the problem(s) they are trying to solve, the available resources, and how the technology will help achieve the desired outcome. Agencies' reasons for considering new technology may include the following:

- General public safety
- Safety of individual victims
- Accountability of conditions of supervision
- Facilitation of behavioral change

- Connection to services
- Efficiency and workload management
- Compliance with legal or legislative mandates

Ultimately, supervision technologies, like any initiative, should be used in a way that is consistent with agency policies, values, vision, and mission.

"Community supervision is a human activity that requires, rather simply, for humans (individuals on probation or parole) to interact with other humans (probation or parole agents) in positive ways to provide accountability, supervision, and support. Any tool, technology, or other apparatus does not replace the need for the human element that was essential to the founding philosophy for community supervision."[40]

Once a purpose has been defined, agencies should identify the goals they are trying to achieve and the specific measures of success. Identifying specific goals can be challenging because of the complexities involved. For instance, public safety is often measured by recidivism reduction; however, this is only one measure and can be complex to define. Solutions that emphasize surveillance (e.g., GPS tracking, computer monitoring) may deter criminal behavior, but recidivism may increase because surveillance will reveal behaviors that would normally be difficult to detect through in-person check-ins. In this scenario, recidivism may increase, but other goals (e.g., accountability) may be met. Further, surveillance-oriented technologies may provide the opportunity for staff to intervene at the earliest stages before a crime occurs, which supports behavioral change and recidivism reduction goals as well. Other technologies may be measured in different ways. For example, one desired outcome of smartphone apps may be an increase in appearance rates because of the automated reminder features. Similarly, the desired outcome from automated reporting systems may simply be a more cost-effective way of managing the low-risk population, so limited resources can be allocated to high-risk cases.

Technical Considerations

Agencies must identify the data required to measure progress and implement systems to collect, store, and protect these data. Considering data needs and uses is critical to evaluating technology success and understanding where modifications or improvements may be needed. For example, proprietary systems often do not automatically sync

with the agency's existing CMS. As a result, staff may need to access several systems (e.g., GPS, drug testing, computer monitoring) to gather the data necessary to supervise a case. Application programming interfaces may be necessary to allow the interoperability of multiple applications and data sharing among agencies within a system.

Supervision technologies often generate sensitive information, and agencies must then consider how the data will be managed, used, and protected. Agencies should:

- Ensure all community supervision data are secure when transmitted and stored.

- Implement policies and procedures to govern the types of data that can be shared with external agencies (e.g., law enforcement) and the circumstances in which data sharing is permitted.

- Consider data retention issues, particularly if the information can be used for evidentiary purposes.

- Establish policies governing data storage aligned with jurisdictional regulations.

- Ensure that data stored by a vendor are accessible by the agency in a readable format outside of the vendor's system because the contract with the vendor may expire before the retention date.

- Aim to minimize information overload and prioritize data streams (e.g., exception reporting,[41] analytics).

- Consider the cost and security implications of data storage practices.

Ethical and Legal Considerations

Agencies must consider the myriad of legal and ethical questions associated with using supervision technologies. Agencies should determine if specific legal authorization is required to use a particular supervision technology. Legislation or specific court orders often provide such authority; however, general conditions of supervision may suffice. Further, agencies must continuously monitor the legal landscape because it can evolve rapidly. For example, as more states legalize recreational or medical use of cannabis, leaders may need to reexamine policies with respect to drug testing.[42,43,44] Similarly, laws requiring lifetime GPS monitoring for those convicted of sexual offenses are being challenged, and, in several states, these laws have been deemed unconstitutional, equating this form of monitoring to an unreasonable search.[45]

If information gleaned from supervision technologies will be used for evidentiary purposes, it is important to consider whether the technology has withstood challenges in court. Thus, leaders should consult with their legal counsel to consider the potential for liability and to develop mitigation strategies. Further, policies and procedures related to timely responses to alerts and violations must be established and followed.

Tools must be implemented in a fair manner to avoid putting certain groups at a disadvantage. Leaders should be cognizant of any significant differences among groups of individuals on community supervision. For example, if differences are observed, leaders should assess whether they are based on risk and the needs of the person on community supervision or if bias exists based on race, economic status, or sex. The goal should be equal treatment among all groups with similar risks/needs with standardization on monitoring, such as drug testing and the duration of time that an individual is tracked using GPS devices. In some cases, specific technology approaches may raise ethical issues. For example, advocacy groups have argued that hair testing for drugs may be racially biased because some studies have found that cocaine binds in higher concentrations to the melanin in dark hair; therefore, hair testing may present bias against people of color.[46] Similarly, AI or algorithmic decision-making tools to determine risk or parole release decisions have drawn scrutiny for potential bias.[47]

Effective implementation must be a central goal of technological innovations in community supervision by introducing efforts to 1) substantively engage and represent the most marginalized individuals; 2) ensure that individuals with the highest needs are prioritized and that benefits and burdens are evenly distributed within all community supervision populations; and 3) require analysis and outcome accountability for technology programs as a measure of effectiveness and success.[48]

Considerations	Questions to Ask

Practical

Purpose and Goals

☐ What is the purpose of using supervision technology? What are the goals of using supervision technology?

☐ What are the limitations of the proposed technology? Do they significantly affect the well-being or engagement of the supervision officer or person on community supervision?

Workload

☐ Have you considered the potential impact of selected supervision technologies on staff workload?

☐ Have you analyzed where there might be reductions (e.g., automated reporting via voice verification or kiosk, smartphone applications for reminders) or increases (e.g., responses to alerts and violations) in workload?

☐ Can systems be automated to help staff alleviate increased efforts resulting from new solutions?

Training

☐ Do you have, or will you have, initial and ongoing or refresher training?

☐ Does the vendor provide training, and if so, is it specified in the contract?

☐ Have you considered training needs for persons on community supervision?

Policies and Procedures

☐ Do you have clear policies and procedures guiding staff on how the technologies are to be used and how to respond to alerts and violations and providing a structure of graduated sanctions or interventions designed to help the person on community supervision comply with the conditions of supervision?

☐ Have you considered the role of agency stakeholders (e.g., courts, law enforcement, prosecutors) in planning?

☐ Are you aligning supervision technology with the needs of the person on community supervision after considering evidence of effectiveness and efficiency?

☐ Can persons on community supervision "earn their way off" a supervision technology with patterns of compliance?

☐ Who will maintain oversight?

Technical

Data Security and Privacy

☐ Have you considered the balance between the right to privacy of the person on community supervision and the government's interest in protecting society?

☐ Have you considered the balance between monitoring high-risk individuals and public expectations for a consistent level of surveillance for every person on community supervision, which might not be feasible or appropriate?

☐ Given that many supervision technologies transmit and store data on the persons on community supervision, are you able to keep data transmissions and repositories secure?

Technology Selection

☐ Will the solution meet the agency's stated performance requirements (e.g., accuracy, reliability, durability, ease of use)?

☐ Have the initial and ongoing costs (e.g., equipment, licenses, maintenance) and operational factors (e.g., impact on agency processes, training needs, workload/overtime, need for additional staffing) been considered?

☐ Can you do a pilot test before engaging in a contract to see how staff and persons on community supervision adapt to the new business practices and identify previously unforeseen issues?

Ethical and Legal

☐ Are tools being implemented in a fair manner to avoid putting certain groups at a disadvantage?

☐ Is there transparency regarding the development, utilization, and evaluation of tools to address potential discrimination?

☐ How can you make community supervision technologies most fair?

☐ Are any implementations that require the person on community supervision to pay for these options counterproductive and a barrier to successful reentry?

☐ Can the agency absorb the costs, especially for pretrial individuals who have not been convicted of a crime?

☐ Has stigma that creates easily observable representation of an individual's judicial status as a result of technology use been considered (e.g., large, bulky devices like GPS ankle monitors, continuous transdermal alcohol sensors)?

☐ Do procurement and use of this technology/product comply with applicable laws and regulations?

☐ Are there checkpoints in place to avoid "oversupervision," that is, applying an intervention that is overly intrusive compared with the risk level or needs of the person on community supervision?

The Future of Community Supervision Technologies

Note: The future outlook for specific technologies is highlighted in the subsequent briefs in this series.

Although community supervision will no doubt remain a people-focused activity with a significant human element, there will also likely be an ever-increasing intersection with technology. The major technology trends of today related to sensors, improved connectivity and communications with 5G and beyond, distributed and cloud computing, data analytics, and AI create new opportunities to improve community supervision in terms of both efficiency and successful supervision outcomes. These advances, however, will also come with challenges such as privacy and security. In addition, societal shifts can enhance or inhibit the use of new technologies in community supervision. For example, the COVID-19 pandemic dramatically impacted societal use of technology. Regardless of whether new technology opportunities and challenges are foreseeable, community supervision will likely continue to be pushed to new levels in the use of technology, and more research into the effects of technology on outcomes and implementation best practices is needed.

Endnotes

1. Different entities use different words to describe and define individuals on community supervision (e.g., offenders, clients). For consistency, this document uses the terms *person(s) on community supervision* or *individuals on community supervision* to align with the Centers for Disease Control and Prevention's guidance on Preferred Terms for Select Population Groups & Communities.

2. National Institute of Justice. (2021, March 7). *Community corrections technology: Experts identify top needs for tech solutions to probation and parole system challenges*. Retrieved from https://nij.ojp.gov/topics/articles/community-corrections-technology-experts-identify-top-needs-tech-solutions

3. Russo, J., Woods, D., Drake, G. B., & Jackson, B. A. (2019). *Leveraging technology to enhance community supervision: Identifying needs to address current and emerging concerns*. Santa Monica, CA: RAND Corporation. Retrieved from https://www.rand.org/pubs/research_reports/RR3213.html

4. Department of Justice, National Institute of Justice, Office of Justice Programs. (2021, September). *Role of human services during community supervision*. Retrieved from https://nij.ojp.gov/topics/articles/role-human-services-during-community-supervision#the-structure-of-community-supervision

5. *House arrest*, also referred to as home confinement, is a particular type of pretrial supervision that requires the defendant to remain at their residence for a defined portion of the day, ranging from nighttime hours through any nonworking hours.

6. American Bar Association. (n.d.). *Pretrial release*. Retrieved from https://www.americanbar.org/groups/criminal_justice/publications/criminal_justice_section_archive/crimjust_standards_pretrialrelease_blk/

7. United States and Pretrial Services, Northern District of Texas. (n.d.). *Pretrial expectations*. Retrieved from https://www.txnp.uscourts.gov/content/pretrial-expectations

8. Department of Justice, Bureau of Justice Statistics. (n.d.). *Community corrections (probation and parole)*. Retrieved from https://bjs.ojp.gov/topics/corrections/community-corrections

9. United States Courts. (n.d.). *Appendix: Sample special condition language (probation and supervised release conditions)*. Retrieved from https://www.uscourts.gov/services-forms/sample-special-condition-language-probation-supervised-release-conditions

10. Kaeble, D. (2023, February). *Probation and parole in the United States, 2021*. U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics. Retrieved from https://bjs.ojp.gov/sites/g/files/xyckuh236/files/media/document/ppus21.pdf

11. Correctional supervision in this instance does not include pretrial supervision.

12. Carson, A., & Kluckow, R. (2023, February). *Correctional populations in the United States, 2021 — Statistical tables*. U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics. Retrieved from https://bjs.ojp.gov/sites/g/files/xyckuh236/files/media/document/cpus21stB.pdf

13. Viglione, J., Alward, L. M., Lockwood, A., & Bryson, S. (2020). Adaptations to COVID-19 in community corrections agencies across the United States. *Victims & Offenders, 15*(7–8), 1277–1297. https://doi.org/10.1080/15564886.2020.1818153

14. Lovins, B. K., Cullen, F. T., Latessa, E. J., & Jonson, C. L. (2018, June). *Probation officer as a coach: Building a new professional identity*. Retrieved from https://www.uscourts.gov/sites/default/files/82_1_2_0.pdf

15. Lovins, B. (2020). *Role of probation officers as coaches versus referees*. Retrieved from https://ndcrc.org/wp-content/uploads/2021/10/Role_of_Probation_Officers_as_Coaches_vReferees.pdf

16. Russo, J., Vermeet, M., Woods, D., & Jackson, B. A. (2022). *Leveraging technology to support prisoner reentry*. RAND Corporation. Retrieved from https://www.rand.org/pubs/research_reports/RRA108-12.html

17. The Pew Charitable Trusts. (2022, January). *Five evidence-based policies can improve community supervision*. Retrieved from https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2022/01/five-evidence-based-policies-can-improve-community-supervision

18. U.S. Census Bureau. (n.d.). *U.S. Census Bureau QuickFacts: United States*. Retrieved from https://www.census.gov/quickfacts/fact/table/US/PST045222

19. Jannetta, J., Breaux, J., Ho, H., & Porter, J. (2014). *Examining racial and ethnic disparities in probation revocation: Summary findings and implications from a multisite study*. The Urban Institute. Retrieved from https://www.urban.org/sites/default/files/publication/22746/413174-Examining-Racial-and-Ethnic-Disparities-in-Probation-Revocation.PDF

20. National Academies of Sciences, Engineering, and Medicine. (2023). *Reducing racial inequality in crime and justice: Science, practice, and policy*. The National Academies Press. https://doi.org/10.17226/26705

21. Ruhland, E. (2016, May). *The impacts of fees and fines for individuals on probation and parole*. Robina Institute of Criminal Law and Criminal Justice. Retrieved from https://robinainstitute.umn.edu/articles/impact-fees-and-fines-individuals-probation-and-parole

22. The Pew Charitable Trusts. (2020, April). *Policy reforms can strengthen community supervision: A framework to improve probation and parole*. Retrieved from https://www.pewtrusts.org/-/media/assets/2020/04/policyreform_communitysupervision_report_final.pdf

23. Jackson, B. A., Vermeet, M., Woods, D., Banks, D., Goodison, S. E., Russo, J., . . . & Witwer, A. R. (2021). *The U.S. criminal justice system in the pandemic era and beyond: Taking stock of efforts to maintain safety and justice through the COVID-19 pandemic and prepare for future challenges*. RAND Corporation. Retrieved from https://www.rand.org/pubs/research_reports/RRA108-8.html

24. U.S. Department of Justice, Office of Justice Programs, National Institute of Justice. (n.d.). *Promising practices from community corrections organizations' COVID-19 response*. Retrieved from https://www.rand.org/content/dam/rand/pubs/research_briefs/RBA100/RBA108-4/RAND_RBA108-4.pdf

Endnotes (continued)

25. Minton, T. D., Zeng, Z., & Maruschak, L. M. (2021). *Impact of COVID-19 on the local jail population, January – June 2020*. U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics. Retrieved from https://bjs.ojp.gov/content/pub/pdf/icljpjj20.pdf

26. Federal Bureau of Prisons. (2022). *COVID resource page*. [This resource page has since been removed.]

27. Budner, A. (2020). Hundreds of Colorado inmates have been released early because of coronavirus. This is one man's story. *CPR*. Retrieved from https://www.cpr.org/2020/09/14/colorado-coronavirus-update-prison-inmate-early-releases/

28. Brennan Center for Justice. (2022, January). *Reducing jail and prison populations during the COVID-19 pandemic*. Retrieved from https://www.brennancenter.org/our-work/research-reports/reducing-jail-and-prison-populations-during-covid-19-pandemic

29. Schwartzapfel, B. (2020, April). *Probation and parole officers are rethinking their rules as Coronavirus spreads*. The Marshall Project. Retrieved from https://www.themarshallproject.org/2020/04/03/probation-and-parole-officers-are-rethinking-their-rules-as-coronavirus-spreads

30. Diaz, M. (2021). *Harris County electronic monitor population skyrockets to nearly 4,000*. KPRC2 News. Retrieved from https://www.click2houston.com/news/investigates/2021/10/15/harris-county-electronic-monitor-population-skyrockets-to-nearly-4000/

31. Pew Charitable Trusts. (2016). *Use of electronic offender-tracking devices expands sharply: Number of monitored individuals more than doubled in 10 years*. Retrieved from https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2016/09/use-of-electronic-offender-tracking-devices-expands-sharply

32. Gigler, A. J. (2020, August). *EM turns 40: A look back and a look ahead at offender supervision technology*. Presentation at the American Probation and Parole Association Annual Conference. These estimates do not include the many thousands more who are monitored by U.S. Immigration and Customs Enforcement for immigration violations.

33. Bauer, E. L., Hagen, C. A., Greene, A. D., Crosse, S., Harmon, M. A., & Claus, R. E. (2006, August). *Kiosk supervision: A guidebook for community corrections professionals*. U.S. Department of Justice. Retrieved from https://www.ojp.gov/pdffiles1/nij/grants/250174.pdf

34. Robertson, R., Vanlaar, W., & Simpson, H. (2008). *Continuous transdermal alcohol monitoring: An agency administrator's guide*. Traffic Injury Research Foundation. Retrieved from https://www.scramsystems.com/wp-content/uploads/2020/06/TIRF-agency-administratgors-guide.pdf

35. van Egmond, K., Wright, C. J. C., Livingston, M., & Kuntsche, E. (2020). Wearable transdermal alcohol monitors: A systematic review of detection validity, and relationship between transdermal and breath alcohol concentration and influencing factors. *Alcohol Clinical and Experimental Research, 44*, 1918–1932. https://doi.org/10.1111/acer.14432

36. Farley, J. (2022, March). *We're suing Wyoming to challenge the 24/7program in Teton County*. ACLU Wyoming. Retrieved from https://www.aclu-wy.org/en/news/were-suing-wyoming-challenge-247-program-teton-county

37. Not all apps have all the functionalities captured in Figure 7; some community supervision apps are focused on supporting one objective (i.e., providing support vs. ensuring accountability).

38. Reliable estimates for the number of individuals or agencies using smartphone applications for community supervision are not currently available. Conversations with experts, vendors, and agencies point to increased use and interest in smartphone applications because of COVID-19.

39. Huchel, B. (2020, August 11). *Artificial intelligence examines best ways to keep parolees from recommitting crimes*. Purdue University. Retrieved from https://www.purdue.edu/newsroom/releases/2020/Q3/artificial-intelligence-examines-best-ways-to-keep-parolees-from-recommitting-crimes.html

40. DeMichele, M. (2020). Research considerations for using electronic technologies with community supervision. In P. K. Lattimore, B. M. Huebner, & F. S. Taxman (Eds.), *Handbook on moving corrections and sentencing forward*. Routledge. https://doi.org/10.4324/9781003008941

41. Exception reporting defines a document that states those instances in which actual performance deviated significantly from expectations, usually in a negative direction. https://www.accountingtools.com/articles/exception-report#:~:text=What%20is%20an%20Exception%20Report,those%20areas%20requiring%20immediate%20action.

42. New York State Corrections and Community Supervision. (n.d.). *Directive: Special condition—Prohibiting adult-use cannabis*. Retrieved from https://doccs.ny.gov/system/files/documents/2021/04/9436.pdf

43. Morris, N. P. (2019). Problem-solving court policies on cannabis use. *Journal of the American Academy of Psychiatry and the Law Online, 50*(4). Retrieved from https://jaapl.org/content/early/2019/09/18/JAAPL.003883-19

44. Farley E., & Orchowsky, S. (2019, July). *Measuring the criminal justice system impacts of marijuana legalization and decriminalization using state data*. U.S. Department of Justice, Office of Justice Programs, National Institute of Justice. Retrieved from https://www.ojp.gov/ncjrs/virtual-library/abstracts/measuring-criminal-justice-system-impacts-marijuana-legalization-0

45. Robertson, G.D. (2019, August 16). *Supreme Court narrows lifetime GPS tracking of sex offenders*. AP News. Retrieved from https://apnews.com/general-news-78d4f8f00ce54bc0817335ca5bd755ec

46. Bourland, J.A. (n.d.). *Hair color bias literature review*. Retrieved from https://www.samhsa.gov/sites/default/files/meeting/documents/september_2013_bourland.pdf

47. Chohlas-Wood, A. (2020, June 19). *Understanding risk assessment instruments in criminal justice*. Brookings Institute. Retrieved from https://www.brookings.edu/articles/understanding-risk-assessment-instruments-in-criminal-justice/

48. Stern, A., MacDonald, G., & Odeh, K. (2020, September). *Creating equitable technology programs: A guide for cities*. The Urban Institute. Retrieved from https://apps.urban.org/features/how-to-create-equitable-technology-programs/#intro