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1. Executive summary

The challenge: Design an integrated system for efficiently coordinating the delivery of services to those experiencing homelessness and to at-risk populations through many providers across a multi-county region.

Context

- The Denver metropolitan region includes 2.9 million people, 56 local governments and hundreds of private and nonprofit service organizations.
- As the regional economy continues to grow rapidly, housing vacancies have declined while housing prices and rental rates have increased.
- Together, these dynamics create an environment in which more people are experiencing homelessness or are at risk of experiencing homelessness.
- The effects on social services agencies, the criminal justice system, health and welfare agencies, schools, libraries and parks have all been magnified as a result.

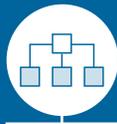
Findings

- The single greatest impediment to addressing the challenge is the fragmented nature of assistance efforts and related data for those experiencing homelessness.
- Services in the region are segmented, delivered by a complex network of government agencies and both private and nonprofit organizations.
- Cities and counties in the area increasingly recognize the benefit of a more coordinated and collaborative approach to funding and providing services for those experiencing homelessness.
- The Denver metro region is known for taking a regional approach to major policy and infrastructure challenges, and it will need to do the same with the issue of homelessness.
- Success will require disciplined governance and change management.

Summary of recommendations



Develop an integrated regional data management system



Improve Homeless Management Information System (HIMS) capabilities



Establish coordinated data entry



Expand coordinated assessment



Develop a common mobile/web application



Build social communities



Create a governance framework



Establish a change management plan



Expand the use of outcome-based metrics



Drive innovation

Vision

The Denver metro region has a strong history of coming together to address tough issues through policy and investment. By implementing the recommendations in this report, the region can make a substantial impact on homelessness.

2. Introduction

A. The IBM Smarter Cities Challenge

By 2050, cities will be home to more than two-thirds of the world's population. They already wield more economic power and have access to more advanced technological capabilities than ever before. Simultaneously, cities are struggling with a wide range of challenges and threats to sustainability in their core support and governance systems, including transportation, water, energy, communications, healthcare and social services.

Meanwhile, trillions of digital devices, connected through the Internet, are producing a vast ocean of data. All of this information — from the flow of markets to the pulse of societies — can be turned into knowledge because we now have the computational power and advanced analytics to make sense of it. With this knowledge, cities could reduce costs, cut waste and improve efficiency, productivity and quality of life for their citizens. In the face of the mammoth challenges of economic crisis and increased demand for services, ample opportunities still exist for the development of innovative solutions.

In November 2008, IBM initiated a discussion on how the planet is becoming “smarter.” By this it meant that intelligence is becoming infused into the systems and processes that make the world work — into things no one would recognize as computers: cars, appliances, roadways, power grids, clothes and even natural systems, such as agriculture and waterways. By creating more instrumented, interconnected and intelligent systems, citizens and policymakers can harvest new trends and insights from data, providing the basis for more-informed decisions.

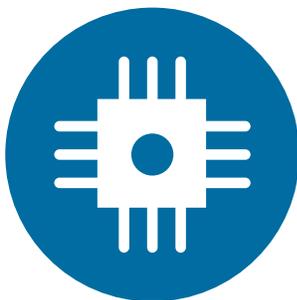
A Smarter City uses technology to transform its core systems and optimize finite resources. Because cities grapple on a daily basis with the interaction of water, transportation, energy, public safety and many other systems, IBM is committed to a vision of Smarter Cities® as a vital component of building a Smarter Planet®. At the highest levels of maturity, a Smarter City is a knowledge-based system that provides real-time insights to stakeholders and enables decision makers to manage the city's subsystems proactively. Effective information management is at the heart of this capability, and integration and analytics are the key enablers.

Intelligence is being infused into the way the world works.

The IBM Smarter Cities Challenge® contributes the skills and expertise of top IBM talent to address the critical challenges facing cities around the world. We do this by putting teams on the ground for three weeks to work closely with city leaders and deliver recommendations on how to make the city smarter and more effective. More than 130 cities have been selected to receive grants since 2010. The Smarter Cities Challenge is the company's largest philanthropic initiative, with contributions valued at more than \$66 million to date.

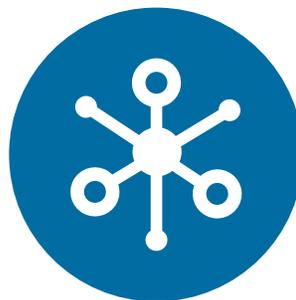
The City of Denver, Colorado, was selected through a competitive process as one of 16 cities to be awarded a Smarter Cities Challenge grant in 2015 – 2016.

During a three-week period in April and May of 2016, a team of five IBM experts worked in the Denver metro region to deliver recommendations around key issues for Mayor Michael B. Hancock, the Metro Mayors Caucus, Metro Area County Commissioners and other key stakeholders.



Instrumented

We can measure, sense and see the condition of practically everything.



Interconnected

People, systems and objects can communicate and interact with one another in entirely new ways.



Intelligent

We can analyze and derive insight from large and diverse sources of information to predict and respond better to change.

Figure 1: Instrumented, interconnected, intelligent

B. The challenge

The challenge in Denver was to design an integrated system for efficiently coordinating the data collection, analysis, sharing and reporting needed to deliver services for those experiencing homelessness and at-risk populations across a multi-county region that includes 2.9 million people, 56 local governments and hundreds of private and nonprofit service organizations.

The IBM Smarter Cities Challenge team's specific assignment was to (1) define the system inputs, processing and outputs required to reduce homelessness, to measure the benefits of any reductions and to monitor the needs and availability of housing and related services; (2) identify input sources; (3) assess system-interfacing opportunities and requirements; (4) design reporting functions; and (5) outline the role mobile technologies could play in addressing the larger goal.

Leaders in the Denver metropolitan region spent considerable effort preparing for the IBM team's arrival. They brought together data, information on current programs and a large number of stakeholders, including government and nonprofit agencies, funding partners, social services workers and formerly homeless individuals. They indicated that insights from IBM were critical due to the complexity of designing a single system that could be used seamlessly across multiple technology platforms, jurisdictions, departments and programs.

Based on this guidance, the IBM team focused its recommendations on improving the coordination of service delivery to those experiencing homelessness among the network of public, private and nonprofit agencies.

3. Findings, context, approach and roadmap

A. Findings, context and approach

Findings

Denver, Colorado, is the capital city of Colorado and the urban core of a seven-county metropolitan region with a population of 2.9 million people living under the jurisdiction of 56 local governments. There are hundreds of private and nonprofit service organizations in the region focused on serving individuals who are experiencing homelessness or are at risk of homelessness. Services are segmented, to varying degrees, according to geographic location, function (shelters, permanent housing or support services), provider type (government, nonprofit or business; large or small; resource-rich or bare-bones) and funding source (public, private or a mix). Each of these providers has a different mission and unique constraints related to government mandates, parent organization guidelines and requirements that come with funding.

As a result, the solutions recommended in this report will need to interface with a variety of existing processes and technologies, taking into account the investments that fiscally constrained local governments and nonprofit providers have already made.

Context

Homelessness has multiple causes rooted in the economic and social fabric of a community. As the Denver metro regional economy continues to grow rapidly, housing vacancies have declined substantially from 8.4% in 2009 to only 4.6% in 2013. This has driven significant increases in housing prices and rental rates. Together, these dynamics have created a macroeconomic environment in which more individuals are experiencing homelessness or are at risk of becoming homeless. They have also magnified effects on social services agencies, the criminal justice system, health and welfare agencies, schools, libraries and parks. For example, there has been a dramatic increase in the number of school-age children experiencing homelessness — more than doubling from 7,187 to 14,969 in less than 10 years — as reported by the Colorado Department of Education.¹ The underlying issues are complex and systemic and will require a comprehensive, integrated approach to regional service delivery. As a result, any solution will need to be collaborative and multidisciplinary in order to deliver sustainable and measurable outcomes.

Cities and counties in the Denver metro region increasingly recognize the benefit of a more coordinated and collaborative approach to funding and providing services for those experiencing homelessness. An example is participation in the 25 Cities² initiative, including the area's implementation of a Coordinated Assessment and Housing Placement System (CAHPS) for veterans and chronically homeless individuals. Preparation and strong support for the Smarter Cities Challenge also demonstrated the increase in regional coordination among stakeholders.

Approach

In 2014, the 41-member Metro Mayors Caucus identified homelessness as a critical regional issue. In 2015, the region applied for and was awarded an IBM Smarter Cities Challenge grant. During a three-week period in April and May of 2016, the Smarter Cities Challenge team worked with regional stakeholders to develop recommendations to improve the regional response to homelessness. The IBM team conducted more than 200 interviews with a wide variety of stakeholders, including members of the Metro Mayors Caucus, Metro Area County Commissioners and Denver City Council, along with representatives from City, county and federal government agencies, healthcare and mental health organizations, nonprofit organizations and those who have experienced homelessness.

B. Roadmap

Homeless populations have many segments, including the chronically homeless, families, youth and many others. To help the IBM team focus on the needs of specific clients and how these needs differ across segments as the technology roadmap was considered, two fictional journey maps were developed. One represents a chronically homeless adult male, and a second represents a single mother with three children. These journey maps, which reflect the desired “journey” these individuals would take after the recommendations are implemented, helped the IBM team adopt a client-centric view as the individual recommendations and roadmap were developed.

1. John, a 50-year-old veteran, struggles with mental illness and has been experiencing homelessness for the last three years. His journey begins in a homeless shelter, where he inputs his data in the online app. Because of a new centralized database and coordinated intake system, the shelter caseworker stays connected with John throughout his journey until permanent supportive housing is identified and he safely moves in.
2. Christie, a single mother of three, has recently experienced homelessness due to a rent increase she could not afford. Christie and her children are living in her car. Through the school system, the family is identified as homeless. The school social worker recommends Family Tree, a local shelter for families, to Christie. The family moves in and with the help of a simplified and well-coordinated intake system, the social worker at Family Tree remains Christie's social worker throughout her journey, providing guidance during a variety of situations, such as legal battles, teenage issues, safety and identifying a subsidized rental within a year of entering Family Tree.

Along the bottom of both maps are the essential foundations for the entire process. “Serve” includes the great work of many service providers. “Measure” begins when the person's information is entered into the system, tracks them throughout their journey and maintains a connection for up to three years after being housed. “Systems” refers to the new integrated data management system, the standard HMIS and the CAHPS processes, all of which help ensure systems of record remain accurate.

Smarter Cities Challenge: Family in Crisis/Homeless in Wheat Ridge, CO



Meet Christie

Christie is a single mother of 3: ages 8, 10, and 14. She works full-time at minimum wage but due to a rent increase, she is evicted and they now live in the car. The school identifies her as homeless.

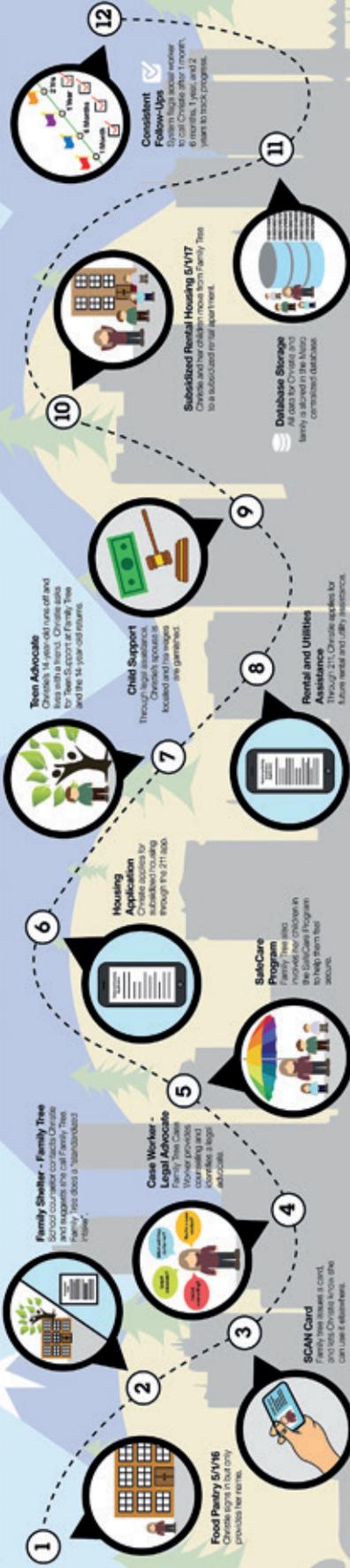
Identify

Assess

Match

Place

Track



Serve: Service Providers, Counseling, Financial Planning, Food, Health

Measure: Data Analytics, Confidentiality, Consistency of Reports, Predictive Modeling

Systems: HMIS, Systems of Record, Systems of Engagement

Figure 3: Christie's journey map

Although they are fictional, these maps express important realities about the journeys homeless populations make to finding housing. They tell similar stories about two very different people, demonstrating the following:

- How simplified and linked processes reduce stress on those experiencing homelessness and improve outcomes
- How coordinated services reduce costs and improve effectiveness for the providers
- How reportable data allows stakeholders and funders to track progress and to ensure future investments are targeted effectively

Taken together, the first five recommendations address these needs. An integrated data system, an improved HMIS, expanded coordinated intake and an enhanced mobile application would help improve input, sharing and analysis of data. Expanding the coordinated assessment process will extend the benefits of the current pilot more broadly.

The sixth recommendation, leveraging social platforms, is a low-cost way to better share knowledge among the many stakeholders. Supporting the six primary recommendations are four management recommendations that are essential to realizing long-term value: establishing a formal governance process, implementing change management, expanding the use of outcome-based metrics and driving innovation.

Although many of the recommendations can be implemented independently, most are interrelated. For the overall roadmap to succeed, all recommendations should be implemented. A suggested timeline is attached (see Figure 4).

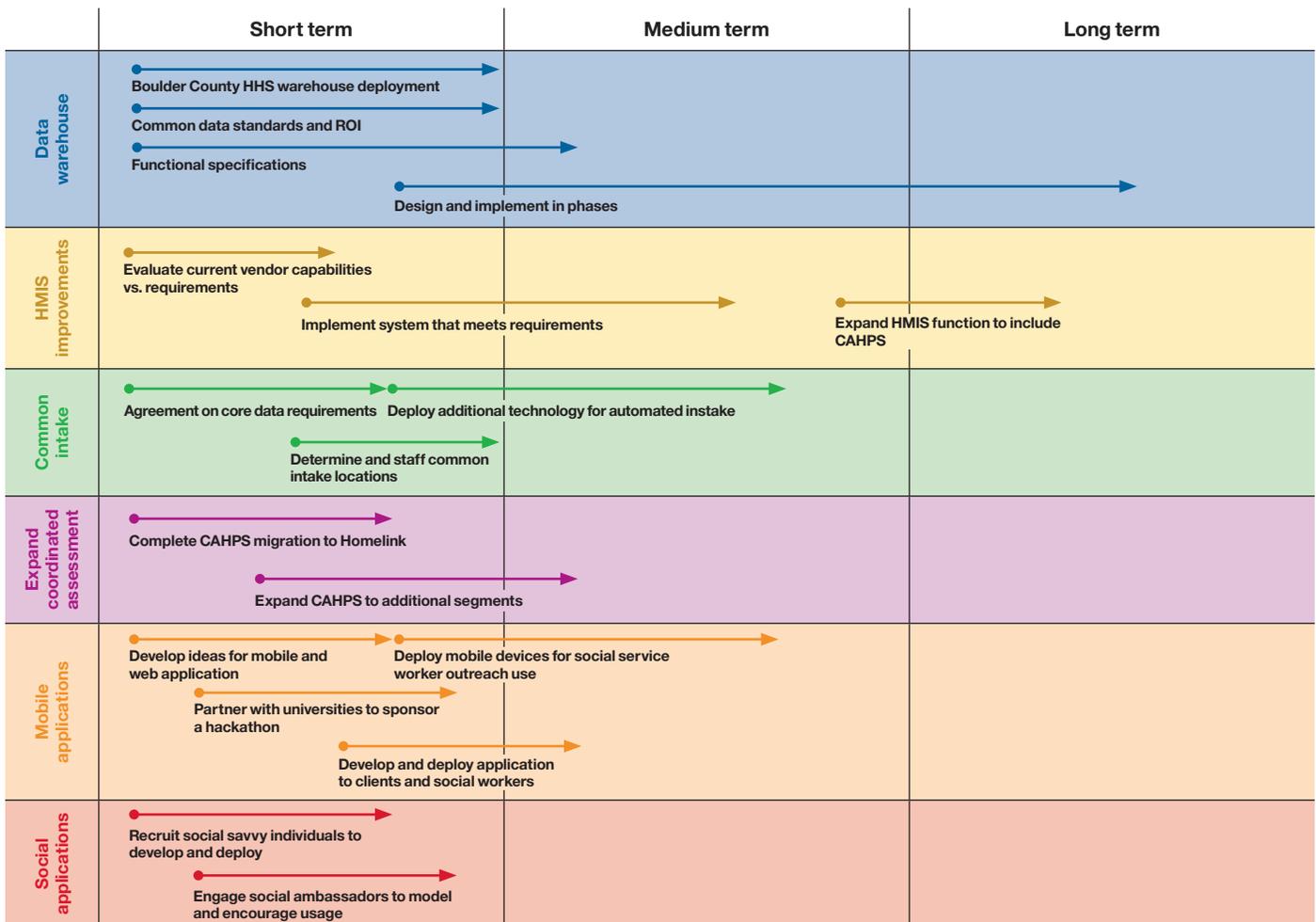


Figure 4: Timeline for implementation

4. Recommendations

Recommendation 1: Develop an integrated regional data management system

The Denver metro region should develop an integrated system that enables coordinated data analysis, reporting and sharing among regional stakeholders.

Scope and expected outcomes

Scope

The Denver metro region needs to implement an integrated human services data warehouse and data management system (see Figure 5).

Key features should include the following:

- Data sourced from as many state and local systems as possible; relevant systems may include the following:
 - HMIS and CAHPS (homelessness and housing)
 - Housing
 - Benefits (food, medical, housing, employment and other assistance programs)
 - Child welfare, child care and child support
 - Case files
 - Health
 - Mental health
 - Criminal justice and public safety
 - Schools
- Automated database feeds that ensure the timeliness of data
- Feeds that include only data that is allowed to be shared according to applicable statutory guidelines (as determined by the work group established in the governance model); certain data may require client consent prior to sharing
- An extract, transform and load (ETL) process that matches records for the same person from multiple data sources and combines like fields
- Data encryption
- Strong data governance, including role-based access that determines who is allowed to see what information, according to applicable statutory guidelines and client consent for sharing; if client consent must be renewed periodically, this must also be incorporated
- Portals that allow authorized stakeholders to access individual client data and make selected modifications to it, including the following capabilities:
 - Clients should have access to their own data, where permitted, including the ability to update confidentiality disclosures.
 - Authorized caseworkers should have access to their clients' data (subject to limitations mentioned above) and should be able to add notes and pertinent information.
 - Caseworkers or clients should be able to upload scans of key identity documents typically required in the benefits application process, such as birth certificates or driver's licenses.
 - Service providers should be able to run summary reports covering all clients.
- Portals with analytics engines that allow authorized stakeholders to access aggregated data to run reports and perform analysis, such as the following:
 - Dashboards (similar to the Knoxville, TN, dashboard)³
 - Trend analysis
 - Program effectiveness, including comparisons across programs
 - Predictive analytics, such as analysis of those at risk of homelessness and those who have been rehoused and are at greatest risk of losing housing
 - Ad hoc reporting

Special consideration should be given to the following:

- Existing best practices, including current implementations, such as in Alleghany County, PA,⁴ and work done to date in Boulder County, CO
 - Commercially available vendor software and platforms for components of the implementation
 - Using a phased approach to functional implementation — not all data sources, portal functions, reports and analytics need to be implemented simultaneously
-

Recommendation 1: Develop an integrated regional data management system (continued)

Scope and expected outcomes (continued)

Expected outcomes

An integrated system will enable more-effective regional coordination of data collection, analysis, sharing and reporting related to human services, including support services for those experiencing homelessness. Specific benefits of this system include the following:

For clients:

- Single input of case history data that is shared across housing and human services providers, instead of repeated data entry
- Quicker receipt of services because caseworkers have a more comprehensive view of client case histories
- Safe storage of identification documents needed to apply for services

For service providers:

- More staff time spent serving clients and less time spent finding and managing data
- Improved ability to quickly understand and meet client needs
- Better overall understanding of program effectiveness

For policymakers and funders:

- Faster data quantification/analysis (from weeks to hours)
- Better use of limited resources through more-accurate information about the effectiveness of programs
- Improved ability to prevent homelessness through predictive analytics

Cost of inaction

The Denver metro region will spend more time and money to achieve desired outcomes due to duplication of effort and inefficient use of limited resources by clients, service providers, municipalities and funders.

Proposed owner and stakeholders	Suggested resources needed
<p>Owner: Working group set up by the steering committee (see Recommendation 7). Working group should include members of county health and human services (HHS) departments.</p> <p>Stakeholders:</p> <ul style="list-style-type: none"> • State • Counties • Cities • Service providers • Funders • Metro Denver Homeless Initiative (MDHI) 	<ul style="list-style-type: none"> • County lawyers to agree on common release of information and data sharing • Substantial investment in technology • State HHS and IT representatives to establish data and data sharing standards (potentially leveraging national standards, such as those from the American Public Human Services Association)

Recommendation 1: Develop an integrated regional data management system (continued)

Dependencies	Key milestones, activities and time frame
<p>The effectiveness of this recommendation will be enhanced by improvements to the quality and timeliness of incoming data on homelessness, which are addressed in parts of Recommendation 2 (Improve HMIS capabilities), Recommendation 3 (Establish coordinated data entry) and Recommendation 5 (Develop a common mobile/ web application).</p>	<p>Short term (by end of 3Q16)</p> <ol style="list-style-type: none"> 1. Governance, funding and resources established by the steering committee. 2. Boulder County deploys its common data warehouse and portals as proof of concept. 3. Common release of information (ROI) and data sharing principles approved by regional lawyers. 4. Functional specification for the data management system developed and approved; specification should indicate which functions are included in each phase. <p>Medium term (by end of 1Q17)</p> <ol style="list-style-type: none"> 1. Standards established for the input data and other interfaces 2. Investigate purchase of system components, such as client management software, data governance and security software, data analytics software, design and implementation services, cloud-based hosting and others 3. Create and issue requests for proposals 4. Create acceptance criteria and test plans for internally and externally sourced components <p>Long term (2 – 3 years)</p> <ol style="list-style-type: none"> 1. Phased implementation of the system

Priority

High — Some subsections of this recommendation, including certain data sources, the ability to edit data in the warehouse and certain types of reporting and analytics, may be a lower priority than the overall system.

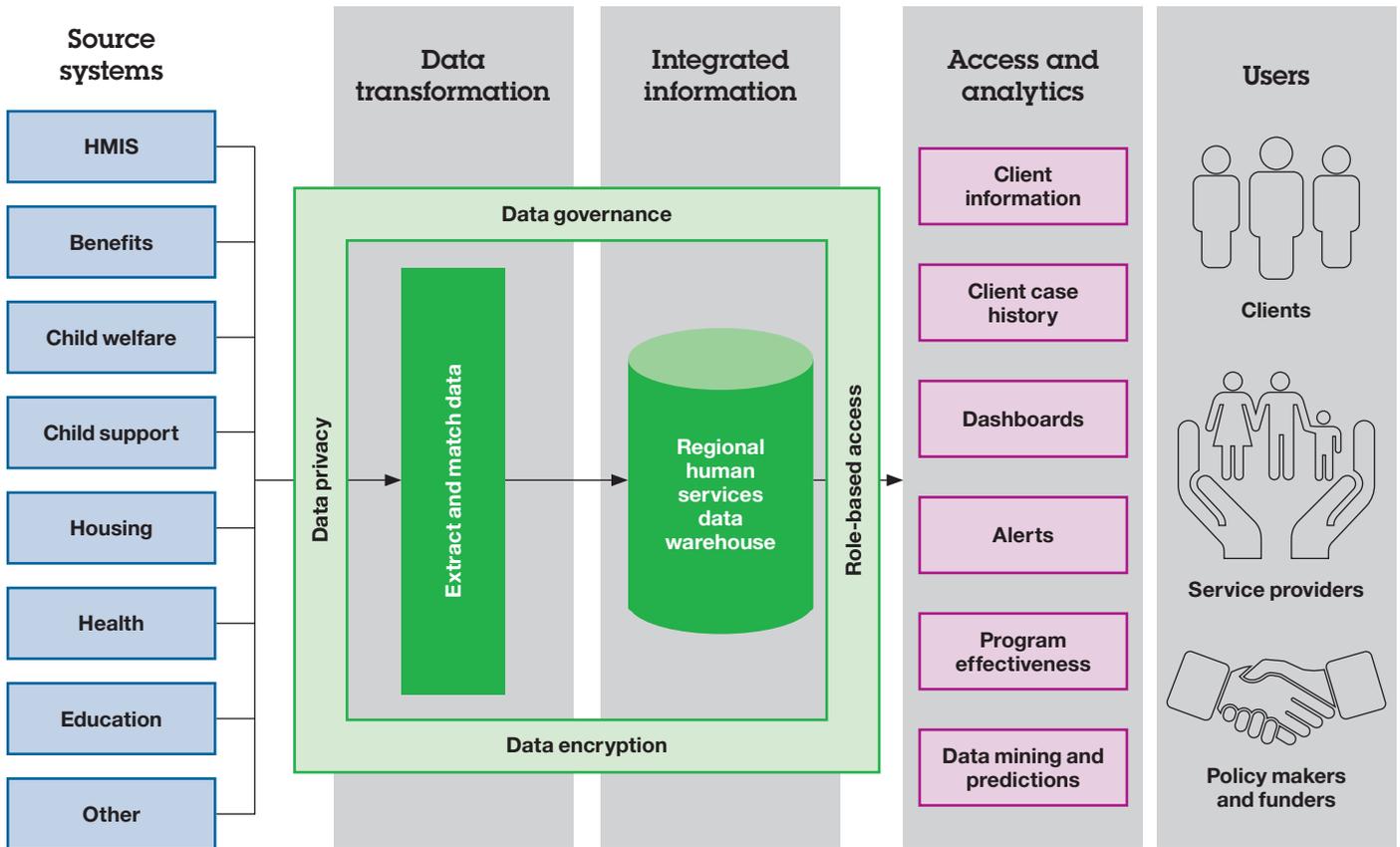


Figure 5: Architecture of an integrated regional data management system

Recommendation 2: Improve HMIS capabilities

The Denver metro region should evaluate current HMIS application capabilities with respect to requirements for interfaces, integration, reliability, reporting and usability and, if appropriate, solicit bids and engage a new vendor.

Scope and expected outcomes

Scope

The Denver metro region needs to implement a robust HMIS (see Figure 6). Its current system has many documented deficiencies, which have been shared with the HMIS vendor. Key features required of the new HMIS include the following:

Functionality

- Meet all current HUD data reporting standards in full, including a process to implement all future changes to HUD data reporting standards by the required deadline
- Allow easy, automated data input, including from service provider databases, mobile devices, client portals and swipe cards used for facility reentry
- Allow data to automatically feed the integrated human services data management system (see Recommendation 1)
- Minimize keystrokes when manual data entry is required
- Allow users to upload attachments to client files easily
- Allow data sharing across users, as governed by highly segmented, role-based access to particular data fields and any individual's data
- Fully implement ROI requirements, including limiting access to data according to ROI agreed to by individual clients
- Support particular needs for a range of people experiencing homelessness (including veterans, chronically homeless, runaway youth, battered women, families, transients and others)
- Include user-friendly, flexible reporting functions for service providers, MDHI and the lead agency, including HUD-required reports, personalized reports and ad hoc reports
- Provide a holistic view of client case files
- Support grouping of individuals into families for data entry and lookup
- Provide tools to help maintain data quality, including flagging potential duplicate records
- Use a mobile application to collect point-in-time data efficiently and automatically feed it into the system
- Allow service providers to enter service referral information and generate alerts for these agencies
- Integrate CAHPS capabilities, including the ability to store information about vacancies and occupancies for the full range of housing models
- Provide a repository for real-time shelter bed availability information, which can be accessed and updated through mobile applications or web portals

System and vendor performance

- Support uptime and response time that meet service provider requirements
- Execute system upgrades that are free of defects when deployed, supported by advance communication, adequate time to test and training available at the time of deployment
- Provide timely technical support for implementation and ongoing development
- Provide adequate training, including online "refresher" information
- Offer forums for collaboration among the regional users and with those outside the region using the same HMIS package

Expected outcomes

An effective HMIS will increase the use of a single database among service providers for the homeless, strengthen regional collaboration among service providers, generate useful and timely reports, allow all stakeholders to improve efficiency and feed data to the regional integrated data system. Specific benefits include the following:

For clients:

- Common data with all service providers instead of multiple, varying data sets
- Additional time with caseworkers

For service providers:

- More time spent serving clients and less time spent entering data
- Higher quality and more-timely reports
- Improved understanding of program performance
- More-effective coordination of services across agencies to monitor regional capacity and match client needs more closely

Recommendation 2: Improve HMIS capabilities (continued)

Scope and expected outcomes (continued)

For policymakers and funders:

- Less effort to maintain the system and supply HUD-required reports
- Access more complete and timely information on regional services for those experiencing homelessness, leading to better prioritization of efforts
- Improved demonstration of outcomes, lending greater confidence to funders for their return on investment

Cost of inaction

As with Recommendation 1, the impact of inaction is continued inefficiency in connecting clients with housing and services. Without a more capable HMIS, key data will not be fed to the integrated data management system described in Recommendation 1.

Proposed owner and stakeholders	Suggested resources needed
<p>Owner: MDHI</p> <p>Stakeholders:</p> <ul style="list-style-type: none"> • Homelessness service providers • HMIS lead agency for MDHI (currently Colorado Coalition for the Homeless) • Balance of state Continuum of Care (CoC) programs and Pikes Peak Continuum of Care (PPCoC), which team with MDHI in contracting with the same HMIS vendor; this collaboration should continue 	<p>Additional funding will likely be needed for the following:</p> <ul style="list-style-type: none"> • Migrating data and processes to a new vendor platform • Ongoing licensing, including improved functionality and support • Total cost to MDHI will likely be moderate, approximately \$200,000 to \$300,000 in the initial year and \$150,000 to \$200,000 in subsequent years.
Dependencies	Key milestones, activities and time frame
<p>This recommendation can be implemented separately from other recommendations. However, the following recommendations will generate functional requirements for HMIS:</p> <ul style="list-style-type: none"> • Recommendation 1: An acceptable data link must be created from HMIS to the integrated data management system • Recommendations 3 and 5: Common intake information must be fully supported by HMIS, and automated intake systems (mobile, scan cards, kiosks and so on) must be fully supported by HMIS • Recommendation 4: CAHPS expansion capabilities must be included in HMIS when CAHPS functionality is integrated with HMIS 	<p>Short term (by end of 3Q16)</p> <ol style="list-style-type: none"> 1. Work with other Colorado CoC programs to generate a set of HMIS functional requirements that will help evaluate the current vendor, considering best-practice HMIS solutions in other regions 2. Issue a request for proposal (RFP) if the current vendor is not meeting these requirements 3. Score RFPs against the functionality requirements, the vendor's proven ability to implement and maintain successful HMIS similar to those in Colorado, the vendor's willingness and ability to minimize the implementation and migration effort for CoC programs and overall system cost over a multiyear period <p>Medium term (by end of 1Q17)</p> <ol style="list-style-type: none"> 1. Review whether Colorado should have a centralized lead agency 2. Determine source(s) of additional funding, if required 3. Determine the HMIS vendor and agree on a contract, which should include specific language that clearly states required functionality and service levels <p>Medium term (by start of 1Q18 if new vendor chosen)</p> <ol style="list-style-type: none"> 1. Build data migration and implementation plans 2. Complete migration to new system and perform training <p>Long term (2018)</p> <ol style="list-style-type: none"> 1. Merge CAHPS function into HMIS
Priority	
<p>High — Most other recommendations depend on this one.</p>	

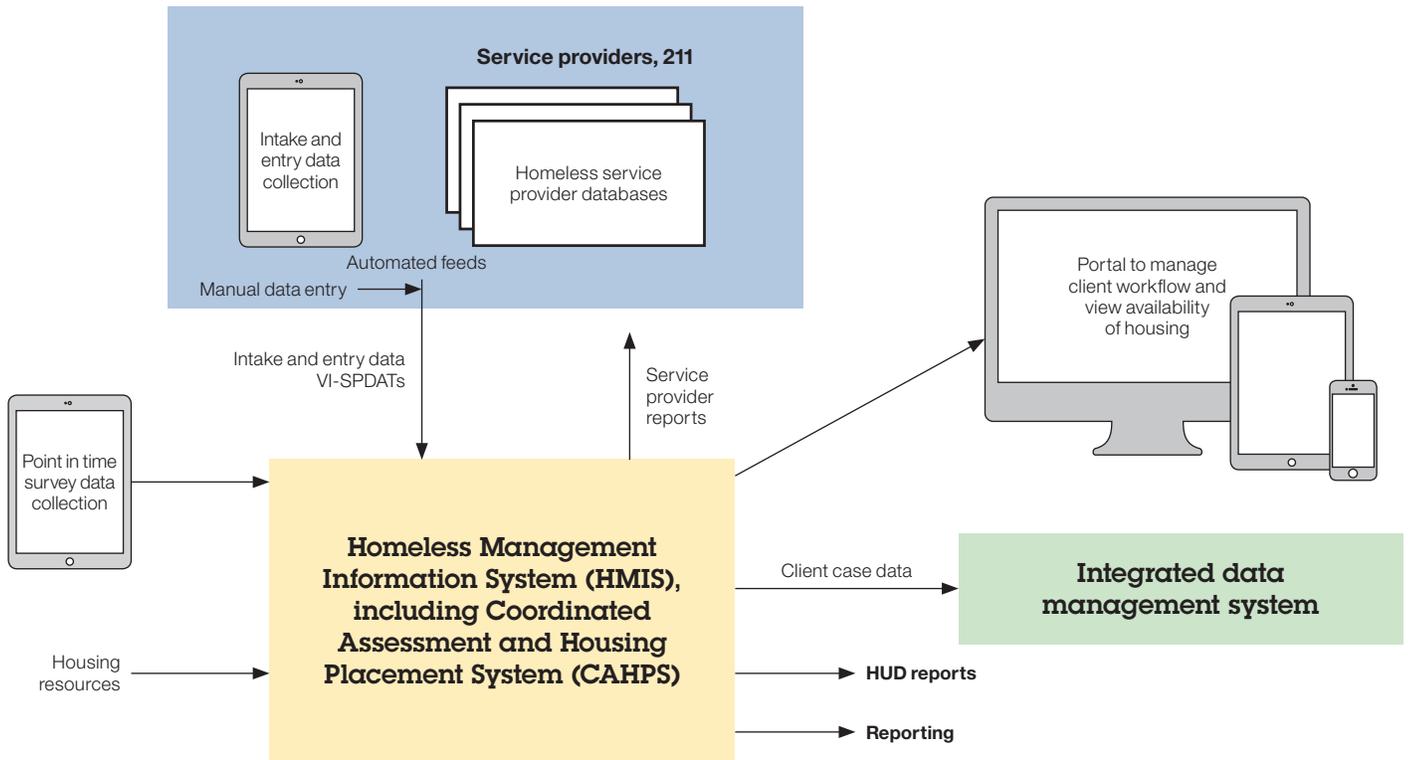


Figure 6: Architecture of a Homeless Management Information System (HMIS)

Recommendation 3: Establish coordinated data entry

The Denver metro region should enhance the intake process with standardized information collected from all service providers for homeless populations.

Scope and expected outcomes

Scope

There are two general models for coordinated entry systems: centralized and decentralized. A geographically centralized “front door” has one location where every client goes to access intake and assessment, while a virtual or telephone-based centralized intake provides one number that clients can call to access intake and get referrals.⁵ A decentralized coordinated entry system offers multiple sites for intake and assessment. Given the large geographical area and diverse needs across the region, the IBM team recommends a decentralized common intake process that includes a virtual option. Key actions include standardizing the list of common data elements collected by all intake locations and expanding the automation of intake and reentry at provider facilities.

Expected outcomes

The expected outcomes of this recommendation include the following:

For clients:

- Simplify the process of obtaining access to services
- Provide access to multiple service programs through one process
- Reduce time and effort required to locate and register for services

For service providers:

- More time serving clients and less time spent gathering information
- Improved coordination of services across agencies to better meet individual client needs
- Less time spent on duplicate data entry

For policymakers and funders:

- Improve coordination and reduce fragmentation
- Establish a trusted source of data about people seeking help and their needs
- Identify current gaps (and predict future ones) in service availability

Cost of inaction

The cost of inaction is continued duplication of effort, both by clients registering for services and by service providers collecting and entering intake data.

Recommendation 3: Establish coordinated data entry (continued)	
Proposed owner and stakeholders	Suggested resources needed
<p>Owner: MDHI</p> <p>Stakeholders:</p> <ul style="list-style-type: none"> • Colorado Coalition for the Homeless • Veterans Administration • United Way (211) • Other nonprofit agencies and service providers 	<ul style="list-style-type: none"> • Individuals trained to provide basic intake services and enter data into HMIS or another data repository • Expansion of 211 role and funding to include telephone or virtual intake • Funding to expand creation and use of scan cards by service providers <p>Cost estimate: Low to medium</p>
Dependencies	Key milestones, activities and time frame
<ul style="list-style-type: none"> • Achieving full value depends on Recommendation 1 (integrated data system), Recommendation 2 (HMIS) and Recommendation 5 (mobile/web). • Incremental value can be gained while these are in process. 	<p>Short term (by end of 2016)</p> <ol style="list-style-type: none"> 1. Finalize list of common intake data elements 2. Gain agreement among service providers to collect common intake data 3. Reassign or hire staff to perform common intake and/or enter data collected by organizations without HMIS training/access (6 to 8 weeks) 4. Evaluate expanding “smart card” creation and usage at more intake locations 5. Assess capabilities of 211 staff to provide virtual intake with scanned/ electronic release of information <p>Ongoing (every 6 months)</p> <ol style="list-style-type: none"> 1. Reevaluate common intake process/data
Priority	
High	

Recommendation 4: Expand coordinated assessment

The Denver metro region should expand the coordinated assessment and housing placement process to additional segments of homeless populations, including youth and families.

Scope and expected outcomes

Scope

A coordinated assessment process includes a set of common procedures and tools used by partnering organizations and agencies within a community to identify, assess, prioritize and match individuals and families experiencing homelessness with appropriate housing and service interventions (see Figure 7). The Metro Denver CAHPS was launched as a pilot in May 2015 with a focus on veterans and the chronically homeless. The Denver metro region should proceed with the planned migration to Homelink and expand the assessed populations to include youth and families.

Expected outcomes

The region will allocate resources more effectively using standardized criteria, improve matching of housing and services with individual and family needs and better identify gaps between assessed needs and existing social services and housing infrastructure.

Cost of inaction

The cost of inaction is suboptimal allocation of scarce resources.

Proposed owner and stakeholders	Suggested resources needed
<p>Owner: MDHI</p> <p>Stakeholders:</p> <ul style="list-style-type: none"> • Colorado Coalition for the Homeless • Veterans Administration • Other nonprofit agencies and service providers • Youth and family human services agencies • Youth and family nonprofits (for example, Urban Peak) • Schools (McKinney-Vento coordinators) 	<ul style="list-style-type: none"> • Funding for developing final assessment tools for youth and families • Funding to train additional caseworkers to perform assessments <p>Cost estimate: Low</p>
Dependencies	Key milestones, activities and time frame
	<p>Short term (by end of 3Q16)</p> <ol style="list-style-type: none"> 1. Finalize youth and family assessments 2. Train additional caseworkers on new assessments 3. Migrate to Homelink
Priority	
High	

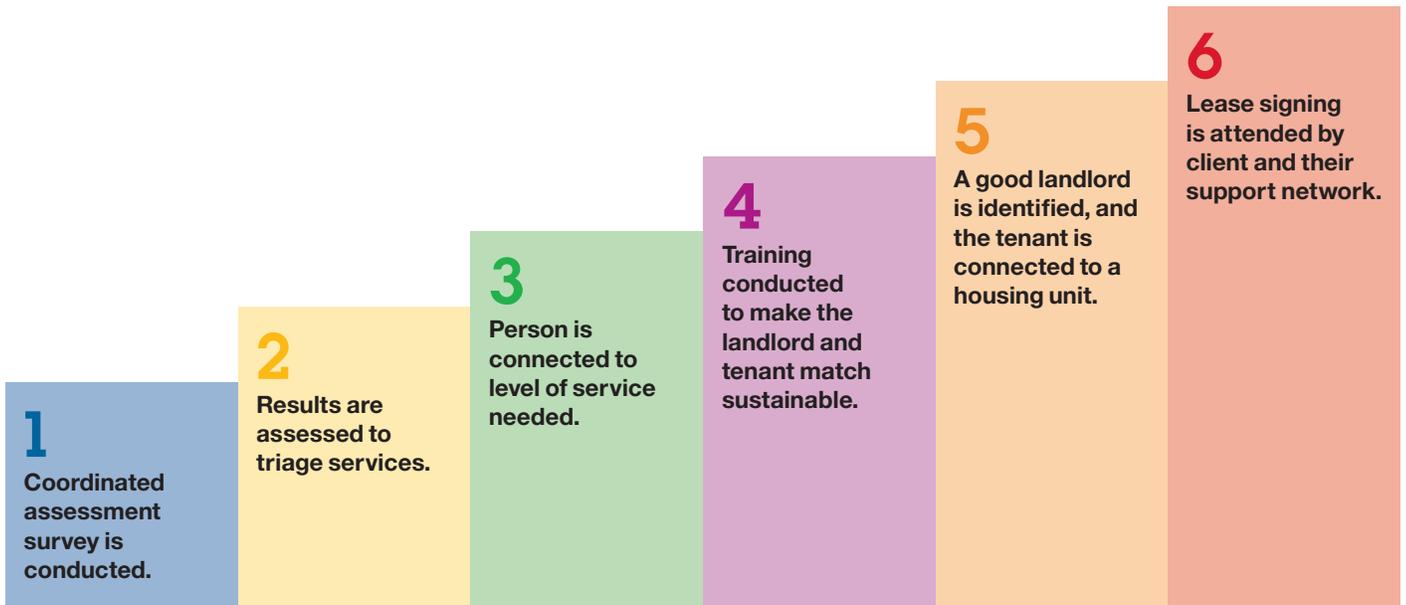


Figure 7: Steps in the coordinated assessment process

Recommendation 5: Develop a common mobile/web application

The Denver metro region should develop a common mobile/web application to simplify the processes for both people experiencing homelessness and service providers and to improve access to services that help prevent homelessness.

Scope and expected outcomes

Scope

Current online resources for locating human services and shelter for those experiencing homelessness are fragmented. A common mobile/web application (potentially linked to 211 and 311) could centralize and simplify this information, improving overall efficiency in service delivery and reducing total cost. The app would allow clients to locate services more easily and would include a recommended common intake form, which could be submitted by the client, service provider or street-based intake worker. This information would be consolidated within an integrated data warehouse (see Recommendation 1).

To develop the app, regional stakeholders can take the following actions:

- Establish requirements for the app through a mobile work group (see Recommendation 7)
- Partner with a local university to sponsor an IBM Watson™ hackathon to create a new common mobile/web app
- Use the hackathon results as a proof of concept (PoC) for the mobile work group
- Have the metro steering committee and mobile work group determine next steps after the PoC (to include funding, vendor selection, timeline and communications)

Expected outcomes

This recommendation will benefit the region in the following ways:

1. Through a simple tap on a smartphone, tablet or computer, clients can easily identify specific services through the app or a conversation with a live agent (such as a 211 operator).
2. Standardized data collected/submitted by intake workers/clients through a common online intake process can be fed into the integrated data warehouse (see Recommendation 1).
3. Outreach workers could use a mobile device (as opposed to a clipboard) to capture intake information and/or look up the person's data, which is more efficient for the outreach worker and less intrusive to those experiencing homelessness.
4. Those most at risk of homelessness could receive immediate assistance to help prevent them from becoming homeless, saving future service costs as well as eliminating the stigma of homelessness.
5. Collected data could be used to analyze future services and funding.

Cost of inaction

Those experiencing homelessness will continue to rely on informal or insufficient data, while those most at risk of homelessness will not know where to turn, will be unable to find resources quickly and, as a result, will experience homelessness at higher rates.

Recommendation 5: Develop a common mobile/web application (continued)	
Proposed owner and stakeholders	Suggested resources needed
<p>Owner: United Way 211, which should own the common application starting in the Denver metro region and expanding statewide</p> <p>Stakeholders:</p> <ul style="list-style-type: none"> • Clients • Service providers, including social workers and/or outreach/street intake workers • Policymakers and funders, including government agencies, foundations, Denver's Road Home and MDHI 	<ul style="list-style-type: none"> • IBM Watson hackathon process • Local university • MDHI sponsorship • Mobile work group • United Way 211 sponsorship <p>Cost estimate: Medium</p> <ul style="list-style-type: none"> • IBM can provide the Watson APIs and PoC, but creating the app would involve additional costs. • Cost of purchasing mobile devices for service providers; using personal devices or hosting mobile donation campaigns could help offset.
Dependencies	Key milestones, activities and time frame
<ul style="list-style-type: none"> • While the app could be created using other cognitive options, this recommendation is based on using an IBM Watson hackathon to develop the PoC • Collection of intake data is dependent on Recommendation 3 	<p>Short term (by the end of 3Q16)</p> <ol style="list-style-type: none"> 1. Review and evaluate University of Texas Austin's 211 app⁶ and other innovative apps⁷ 2. Connect with IBM university hackathon contact 3. Establish app criteria (concurrently with scheduling the hackathon) <p>Medium term (by the end of 2Q17)</p> <ol style="list-style-type: none"> 1. Sponsor the hackathon 2. Evaluate PoC 3. If decision is made to move forward with app development, contact cognitive vendors 4. Evaluate coordination with current 211 data and processes 5. Evaluate coordination with Denver's 311 spatial data
Priority	
High — Increased ease of use for clients and service providers as well as the centralized information intake are key success factors for this entire initiative.	

Recommendation 6: Build social communities

The Denver metro region should leverage popular social platforms (Facebook, Instagram, Twitter, YouTube and so on) to build social communities for clients, service providers and others.

Scope and expected outcomes

Scope

The Denver metro region should establish a social work group to create targeted social communities that facilitate information sharing among individuals and groups.

Expected outcomes

For clients:

- Shared availability of resources for those seeking services (housing, food and so on)
- Virtual support groups among those experiencing homelessness
- General information and education

For service providers:

- Sharing best practices among organizations pursuing similar objectives
- Identification of emerging issues, concerns and successful programs

For volunteers and funders:

- Building community awareness and involvement (through volunteer opportunities)
- Analysis of social platform usage data
- Analysis of social communities to identify gaps in services and direct funds accordingly

Cost of inaction

The cost of inaction will be a lack of cohesive information for those experiencing homelessness as well as those working with the homeless, resulting in inconsistent views of homeless populations and services and missed opportunities to share resources.

Proposed owner and stakeholders	Suggested resources needed
<p>Owner: MDHI/CLOSE TO HOME</p> <p>Stakeholders:</p> <ul style="list-style-type: none"> • Those experiencing homelessness • Formerly homeless individuals • Service providers • Volunteers • Metro region steering committee 	<p>Social work group made up of individuals who use social platforms in their daily lives (for example, AmeriCorps interns)</p> <p>Cost estimate: Low, as most social platforms are free to use; skilled resources will be required to coordinate community building efforts across platforms.</p>
Dependencies	Key milestones, activities and time frame
<p>This recommendation is independent of others, but it does enhance Recommendation 5 (mobile app).</p>	<p>Short term (by the end of 2016)</p> <ul style="list-style-type: none"> • Create work group • Launch pilot of targeted social communities <p>Ongoing</p> <ul style="list-style-type: none"> • Promote availability to intended users • Review platforms, videos, guides, social activities, blogs and new communities • Review of work group actions by project manager
Priority	
<p>Medium — This recommendation is relatively low cost and could deliver immediate results.</p>	

Recommendation 7: Create a governance framework

The City and County of Denver, along with MDHI leadership, should establish a governance framework to guide and oversee the implementation of the recommendations in this report.

Scope and expected outcomes

Scope

A governance framework will help ensure the Denver metro region team sustains its focus and commitment to the roadmap of recommendations. This focus will help the region achieve its objectives for improving services for those experiencing homelessness.

The governance framework will be critical in helping the region accomplish the following:

- Gain input from independent subject matter experts on specific initiatives
- Agree on and oversee priorities as efforts progress
- Track progress of initiatives and recommendations
- Address issues and roadblocks that may arise

Regional leadership should create a multitiered governance framework that includes a steering committee, board of experts and work groups. The framework will need to be robust in order to align people, processes and systems with initiatives designed to reduce homelessness and improve services and programs.

Governance models should be well-defined and properly structured. They should provide guidance, clarity and consistency for all those involved and drive accountability and transparency with respect to performance and outcomes. Without robust and coherent structures in place, it is unlikely that the region will be able to sustain progress on the recommendations (both for individual recommendations and the overall effort).

The diverse range of stakeholders who need to collaborate, participate, understand and/or execute the recommendations must have a common understanding of expectations. Areas that the governance framework should address include the following:

- Decision-making responsibilities
- Management of priorities and availability of resources
- Management and controls for changing priorities
- Reporting of deployment and adoption metrics
- Policy for sharing progress information and metrics
- Addressing roadblocks
- Identifying and mitigating risks

To establish the governance framework, regional leaders should take the following steps:

Step 1

Develop and empower a steering committee to review and select the appropriate recommendations in this report and to commit to specific outcomes for the community. The steering committee should include mayors, county executives, MDHI executives and funders along with the leads of each work group. An additional function that reports to the steering committee will provide overall project management. Ideally, the steering committee should appoint a chairperson, but not an individual who is already a work group lead.

Step 2

Establish a board of experts (including service providers, funders, county HHS executives and so on) whose members are independent and have subject matter expertise that will help the steering committee review and monitor the progress of the roadmap. This group will also provide valuable industry insight and experience from outside core leadership. The board should be empowered to monitor initiative progress, to provide input to the work groups and to advise the steering committee on the execution and delivery of the roadmap. The board of independent experts will be instrumental in providing the accountability required to ensure priorities do not shift and the roadmap's momentum is sustained.

Recommendation 7: Create a governance framework (continued)

Scope and expected outcomes (continued)

Step 3

Work groups and their respective leaders should be established by the steering committee to lead the execution of individual recommendations. Each work group should include different individuals, as opposed to the same group of people working on multiple tasks. Work groups should include a cross section of representatives to help ensure diversity in experience. Gaining input from all groups and considering a range of ideas and perspectives is paramount to ensuring that all possible options have been considered and the eventual choice represents as many community needs as possible.

Each functional body within the governance framework should have clear terms of reference for critical information, such as the following:

- Purpose, roles and authority
- Number of members
- Constitution, formation and dissolution
- Tenure
- Frequency of meetings
- Individual responsibilities
- Changes to membership

Expected outcomes

- Groups are able to focus on the “big picture” vision as well as individual areas of delivery.
- Accountability, roles and responsibilities are clear.
- Diverse views are included in decision-making processes.
- Knowledge of external experts is leveraged.
- Decision-making is focused on merit.
- The roadmap will be followed consistently, even when political representatives change.
- Community confidence in program management and the integrity of outcomes will increase.

Cost of inaction

- Momentum will be lost, and the focus of work will shift as priorities change.
 - The community, service providers and clients may lose confidence in the system.
 - Resources will be allocated to inefficient or suboptimal programs.
 - Learning from opportunities presented by other cities and countries will be limited.
-

Recommendation 7: Create a governance framework (continued)	
Proposed owners and stakeholders	Suggested resources needed
<p>Owners: MMC, MACC and MDHI, with Catherine Marinelli, Executive Director, MMC, or Anthony E. Graves, Director of Regional Affairs, to manage</p> <p>Stakeholders:</p> <ul style="list-style-type: none"> • Clients • Service providers • Funding organizations 	<ul style="list-style-type: none"> • Time commitment from City, county and MDHI leadership, who must show active participation and commitment • Project manager funding <p>Cost estimate: Low</p>
Dependencies	Key milestones, activities and time frame
<p>This recommendation requires a willingness to appoint independent members to the board of experts and empower them to monitor progress. Leadership should nominate representatives with diverse experience (that is, service providers, state representatives and so on) to ensure broad-based input and stakeholder buy-in.</p>	<p>Short term</p> <ol style="list-style-type: none"> 1. Confirm governance framework 2. Define roles and responsibilities for each governing body (board, steering committee and work groups) 3. Define terms of reference for each body 4. Nominate members for each role 5. Review nominations and appoint members 6. Communicate governance framework to stakeholders and community 7. Ensure steering committee and board of experts provides initial guidance on scope of IBM team's recommendations to pursue and form work groups accordingly
Priority	
<p>High — This is a low-cost effort that is foundational to the success of all other recommendations.</p>	

Recommendation 8: Establish a change management plan

The regional team should develop a change management plan to help broadcast information, opportunities, responsibilities and achievements in its work to reduce homelessness. An effective change management plan will help ensure the initiative progresses from deployment to broad stakeholder adoption, making it more likely to achieve targeted outcomes.

Scope and expected outcomes

Scope

To make a broad and lasting impact on homelessness, regional leaders, service providers, funders and other individuals will need to be involved at many levels as the roadmap of recommendations is implemented.

Many of these groups and individuals will need to change how they operate. Some will need to change the focus of current projects. Others may need to stop what they are doing altogether. These transitions will be challenging. Nevertheless, they are critical.

The region must leverage and expand enduring and trusting relationships to facilitate collaboration and understanding throughout the community. The community must align on what needs to be done differently, why these changes are necessary, the role each stakeholder needs to play and the effects these changes should create. A considered, long-term plan for change will be key to addressing issues related to homelessness.

The change management plan should be developed by a leader or team with expertise in managing and implementing change to ensure it addresses the key dynamics of change and incorporates best practices in change management to help ensure success. The leader developing the plan should report regularly on progress to the steering committee.

Key change dynamics in the Denver metro region include the following:

- How change will affect various constituencies (clients, service providers, administrators and so on)
- What the key challenges will be
- What likely responses will emerge as changes are implemented in the region (see Figure 8)

Best practices for change management include the following:

- Leveraging fundamental, pragmatic steps to assist leaders with significant change:
 - Articulate the vision
 - Involve leaders
 - Engage and prepare stakeholders
 - Align the organization
 - Monitor results
- Plan the specific change management activities to integrate into each phase of the initiative (see Figure 9)

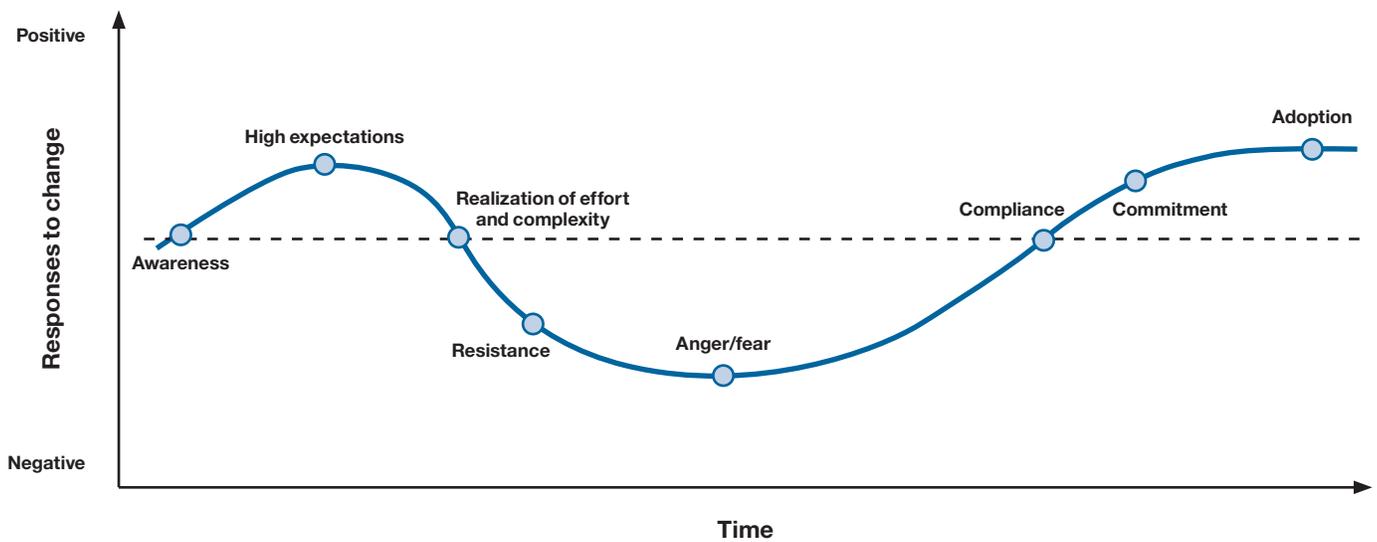
Expected outcomes

- Increased trust through engagement and communication among regional leaders and stakeholders in the fight against homelessness
- Expanded collaboration that makes it possible to achieve other recommendations in this report
- Greater engagement as more groups and individuals understand the impact of changes
- Collective celebration of success as milestones are reached
- Stronger community buy-in on efforts to reduce homelessness because everyone is involved in the process
- Focus that helps ensure sustained momentum

Cost of inaction

Poor engagement with stakeholders about the rationale, activities and outcomes related to initiatives to reduce homelessness will heighten confusion and antagonism, increasing the risk that the plan will be derailed before it has a chance to succeed.

Recommendation 8: Establish a change management plan (continued)	
Proposed owner and stakeholders	Suggested resources needed
Owner: Individual or team named by the steering committee to lead the change management function (Anthony E. Graves to manage)	Individual(s) skilled in change management Cost estimate: Low
Dependencies	Key milestones, activities and time frame
This recommendation depends on regional support for a change management strategy as well as improved communications among all stakeholders.	Short term <ul style="list-style-type: none"> • Name a change management leader • Develop a change management plan with stakeholder input • Publish the change management plan for owners and targets • Begin cadence of progress reports to steering committee
Priority	
High	



Purposely managing change helps people commit to and, ultimately, adopt a change

Figure 8: Responses to organizational change over time

Project lifecycle



Figure 9: The change management lifecycle

Recommendation 9: Expand the use of outcome-based metrics

Expanding the use of outcome-based metrics will improve the results of regional initiatives to reduce homelessness, giving service providers a clearer view of program results, administrators a better understanding of the relevant issues and progress and funders more confidence in their return on investment.

Scope and expected outcomes

Scope

Currently, many providers and funders assess program performance and make decisions about program viability based on static metrics that measure only the completion of an activity, such as the number of clients served or the number of rent subsidies delivered.

Adopting outcome-based metrics will help regional service providers, administrators and funders better understand the actual impact of programs so that they can determine whether the service has made a difference with greater confidence. For example, after a client has received a rent subsidy, the program that provided that subsidy should be able to determine if the individual was able to find permanent housing, as well as know if they remain housed after six months and track the individual's subsequent success in other relevant service areas (see Figure 10).

Many programs are assessed with lagging metrics. In other words, measurement systems report on what has already happened — often many months after the activity or service has been completed. Outcome-based metrics will provide richer data to help providers track key indicators and respond to needs with more agility.

Outcome-based metrics, if deployed effectively, can drive collaboration and accountability. Providers want to understand that the work they do is having the intended effect, so it is important that performance reviews not be punitive.

Increasingly, organizations want to understand how they are performing and where they should focus limited resources. The goal of establishing and reporting outcome-based metrics is to develop a clearer and more-accurate understanding of program performance and thereby help service providers and funders allocate resources to services and programs that yield the greatest benefit to those they are intended to serve.

While establishing an outcome-based system will be challenging, it must be a top priority. Funders will play a key role because they can require performance reporting in funding applications and use outcome-based assessments to make funding decisions.

Service providers should transition to outcome-based metrics in a phased approach and in parallel with the development of a data warehouse (see Recommendation 1) to build confidence in the new approach. All key stakeholders (service providers, funders, administrators and IT teams) will need to be involved in this work. Stakeholders should agree on what performance metrics to measure first by program type and then determine how to measure those metrics (see Figure 11).

Some providers in the region are already reporting success with new outcome-based metrics. These practices should be shared widely to help other organizations engaged in similar efforts.

Expected outcomes

- Programs measure the impact on the person they are serving.
- Program benefits can be celebrated and replicated more easily.
- Program success will be measured more accurately.
- Funding and resources will be allocated to more-effective programs.
- There will be transparency in performance and accountability for results.
- Regional service providers will likely be prioritized by funders.

Cost of inaction

- Success of programs will not be understood clearly or measured appropriately.
- Programs will lack the focus required to assist those they intend to serve.
- Resources and funding may be directed to programs that yield minimal benefits.
- Learning from successful programs will not be leveraged.
- Competition among agencies for funding will perpetuate a non-collaborative mind-set.
- Funders and other community members may lose confidence that homelessness can be improved.

Recommendation 9: Expand the use of outcome-based metrics (continued)

Proposed owner and stakeholders	Suggested resources needed
<p>Owner: City of Denver Director of Performance Evaluation</p> <p>Stakeholders:</p> <ul style="list-style-type: none"> • Funders • Service providers • Government administrators • Denver metro region community 	<ul style="list-style-type: none"> • Agreed-upon data sources for collecting performance information • Reporting templates <p>Cost estimate: Low</p>
Dependencies	Key milestones, activities and time frame
<ul style="list-style-type: none"> • Service providers must adopt an outcome-based approach to reporting, program management and resource allocation. • Service providers need a technology solution and a data strategy (see Recommendation 1) to help track outcome-based data. 	<p>Short term (by end of 2016)</p> <ol style="list-style-type: none"> 1. Identify all key stakeholders and communicate context and intention 2. Establish work group headed by the City of Denver Director of Performance Evaluation 3. Discuss current metrics, explore outcome-based metrics and develop performance indicators by program type 4. Confirm funders will refer to outcome-based metrics for resource allocation <p>Medium term (by end of 2Q17)</p> <ol style="list-style-type: none"> 1. Agree on the metrics to measure, then determine how to measure those metrics 2. Agree on intervals for reporting, with more-challenging metrics measured less frequently or at a later stage 3. Establish a timeline and forum to share performance information and knowledge 4. Begin tracking and reporting new metrics 5. Maintain a work group forum to review, revise and update as required
Priority	
High	

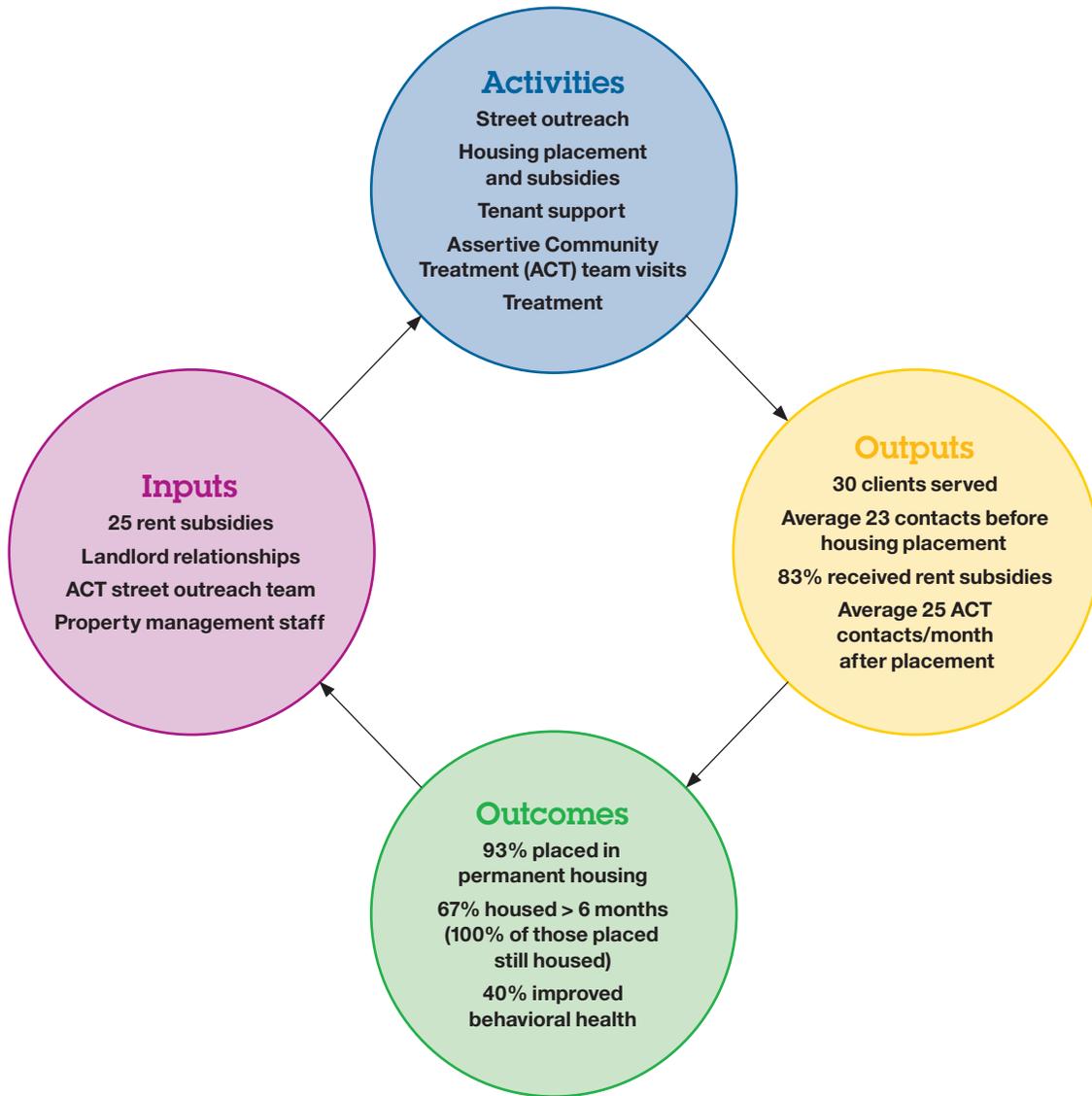


Figure 10: Performance management framework

	Prevention	Outreach	Emergency shelter	Transitional housing	Rapid re-housing	Permanent supportive housing
Number served	✓	✓	✓	✓	✓	✓
Successful housing outcomes	✓	✓	✓	✓	✓	✓
Average length of stay			✓	✓	✓	✓
Recidivism	✓	✓	✓	✓	✓	✓
Successful income outcomes			✓		✓	
Direct client assistance utilization		✓		✓	✓	
Occupancy			✓			✓

Figure 11: Examples of performance indicators by program type

Recommendation 10: Drive innovation

Leverage the capabilities provided in Recommendations 1 – 6 to drive high-value innovation throughout the region.

Scope and expected outcomes

Scope

The Denver metro region has a history of innovation in the social service space and the issue of homelessness in particular. Evidence of this can be found in the recently issued social impact bond program⁸ to address homelessness, Denver's Road Home⁹ and its 10-year plan to end homelessness, the City of Aurora's "Aurora@Home" Collaborative Plan¹⁰ as well as Boulder County's leadership in establishing a common data warehouse.¹¹

With the information system integration, service provider collaboration and analytics enabled by the recommendations in this report, the Denver metro region should be able to accelerate innovation, deliver more value to citizens and increase the return on funders' investments.

There are three specific areas where the region can leverage new capabilities to drive innovation and long-term value:

1. Leverage collected data and outcome-based metrics to attract more funding to the region.

Major individual donors, foundations, government agencies and new types of "impact investors" are all utilizing, and in some cases requiring, more-sophisticated performance measures. By leveraging a region-wide view of needs, programs and performance, the Denver metro region has an opportunity to establish itself as a leader in research, program evaluation and learning. Replicating the random control trial methodology used in the SIB program to address homelessness will elevate the region's credibility with funders. These capabilities should be applied systematically to all forms of development and fundraising.

2. Build cognitive or intuitive models to identify opportunities for creative forms of program intervention and need prevention.

Historically, community-based programs and services to address homelessness have been built in siloes, serving individuals by focusing resources on one concern at a time. Programming typically focuses on people in deep crisis. By creating a holistic view of clients and leveraging provider collaboration, the region can implement more evidence-based practices and integrated solutions. In addition, analytics can help predict the best course of action for an individual with a given set of circumstances, based on evidence collected (and patterns recognized through the "cognitive" model) across the region for thousands of clients by hundreds of service providers over many years.

3. Expand provider collaboration to deliver improved outcomes more quickly.

Designing and implementing solutions that break down the traditional barriers that separate housing, human services and health systems has been shown to improve community outcomes for citizens. The Denver metro region's approach to integrating data systems, together with providers' ability to deliver data-driven and cross-sector solutions, has the potential to deliver these same benefits. Common intake, coordinated assessment and coordinated case management are three elements necessary to fulfill this promise.

For all three areas of innovation, and for others that regional thought leaders will develop, a special focus and funding model should be developed to facilitate the creation and incubation of innovative approaches. Thought leaders should hold competitions for seed funding (provided by grant makers) and other resources (from government, academia, service providers and so on) from within the social service community. A strict requirement for collaborative models, outcome-based evidence, potential scalability and knowledge sharing should be enforced. An example of this approach can be found in the Social Innovation Fund (SIF) from the Corporation for National and Community Service.¹²

Expected outcomes

- Expansion of existing funding sources and pursuit of innovative new sources
- Improved program intervention and outcomes for clients as a result of leveraging cognitive analytic tools
- Accelerated innovation and outcomes through closer collaboration among providers

Cost of inaction

The cost of inaction will be a missed opportunity to capitalize on systems investments, resulting in suboptimal delivery of services to clients and inefficient use of limited resources.

Recommendation 10: Drive innovation (continued)	
Proposed owners and stakeholders	Suggested resources needed
<p>Owners: Steering committee and work groups</p> <p>Stakeholders:</p> <ul style="list-style-type: none"> • Funders • Service providers • Government administrators • Denver metro region community 	<p>Funder, service provider and government staffing (part-time) to oversee innovation initiative</p> <p>Cost estimate: Low — Estimated funding for the initial innovation contest and/or projects is \$100,000.</p>
Dependencies	Key milestones, activities and time frame
<p>The steering committee must commit to driving relentless innovation as part of the regional initiative.</p>	<p>Short term</p> <ul style="list-style-type: none"> • Steering committee agrees on innovation initiative model • Identify initial innovation team members to implement (virtual) model • Identify funders willing to support the initial investment required
Priority	
<p>Medium</p>	

5. Conclusion

The Denver metro region has a strong history of coming together to address tough issues through policy and investment. By implementing the recommendations in this report and by continuing to work to make more affordable housing available, the region can make a substantial impact on homelessness. However, success will require disciplined governance and change management.

When implemented, these recommendations will improve service to clients, increase the ability to quantify the impact of specific investments, help ensure more-efficient use of limited resources and help reduce homelessness.

The IBM Smarter Cities Challenge team would like to thank Mayor Hancock and members of his office, Mayor Hogan, the Metro Mayors Caucus, MACC, MDHI, Denver's Road Home, Mile High United Way and all of the stakeholders, both public and private, that provided the insight and perspective captured in this report.

6. Appendix

A. Acknowledgments

- Denver SCC Steering Committee
- Denver Mayor Michael Hancock
- Aurora Mayor Steve Hogan
- Anthony E. Graves, Director of Regional Affairs, Denver Mayor's Office
- Bennie Milliner, Executive Director, Denver's Road Home
- Catherine Marinelli, Executive Director, Metro Mayors Caucus
- David Edinger, Chief Performance Officer, City and County of Denver
- Gary Sanford, Executive Director, Metro Denver Homeless Initiative (MDHI)

Elected Officials

- Arvada Mayor Marc Williams
 - Boulder Mayor Suzanne Jones
 - Centennial Mayor Cathy Noon
 - Edgewater Mayor Kris Teegardin
 - Englewood Mayor Joe Jefferson
 - Federal Heights Mayor Daniel Dick
 - Golden Mayor Marjorie Sloan
 - Lakewood Mayor Paul Adams
 - Longmont Mayor Dennis Coombs
 - Northglenn Mayor Joyce Downing
 - Superior Mayor Clint Folsom
 - Thornton Mayor Heidi Williams
 - Westminster Mayor Herb Atchison
-
- Adams County Commissioner Chaz Tedesco
 - Adams County Commissioner Erik Hansen
 - Adams County Commissioner Eva Henry
 - Adams County Commissioner D'Dorisio
 - Arapahoe County Commissioner Bill Holen
 - Boulder County Commissioner Elise Jones
 - Jefferson County Commissioner Casey Tighe
-
- Denver City Councilwoman Deborah Ortega
 - Denver City Councilwoman Robin Kniech
 - Denver City Councilwoman Stacie Gilmore
 - Denver City Councilman Wayne New

US Senator Michael Bennet's Office

- Alexis Crews, Community Outreach and Constituent Advocate
- Alisha Andrews, Constituent Advocate
- Rosemary Rodriguez, State Director

Government officials

- Aaron Gagne, Director, Community Planning and Development, HUD
- Anne Stavig, Presiding Judge, City of Lakewood
- Bob McDonald, Public Health Administrator, City and County of Denver
- Casey Earp, Assistant City Manager, City of Boulder
- Daphne McCabe, Coordinator, Special Projects, Boulder County Department of Housing & Human Services
- Dana Scott, State Homeless Education Coordinator, Colorado Department of Education
- David Quinones, Denver Deputy Chief of Police
- David Riggs, Strategic Partnerships Manager, Adams County Housing Authority
- Don Mares, Denver Deputy Mayor and Director of Human Services
- Don Wick, Arvada Police Chief
- Evan Dreyer, Deputy Chief of Staff, Denver Mayor's Office
- Frank Alexander, Director, Boulder County Department of Housing & Human Services
- Ismael Guerrero, Executive Director, Denver Housing Authority
- Jason McRoy, Division Director, Boulder County Department of Housing & Human Services
- Jeff Hirota, Vice President of Programs, Denver Foundation
- Jennifer Daly, Psychologist, US Department of Veteran Affairs
- Jenn Lopez, Director of Homeless Initiatives, Governor's Office, State of Colorado
- Jenny Schiavone, Directory of Citywide Marketing, City and County of Denver
- Jim Adams Berger, Manager of Strategic Initiatives, Boulder County Community Services
- Jose Cornejo, Executive Director of Public Works, City and County of Denver
- Karen Rahn, Director of Human Services, City of Boulder
- Karen Roney, Community Services Director, City of Longmont
- Katie Bonnamaso, Homeless Programs Specialist, Colorado Division of Housing
- Katherine Smith, Division Manager, Arapahoe County Department of Human Services

- Kathy Otten, Division Director, Justice Services, Jefferson County Department of Human Services
- Kenneth Arellano, Workforce Liaison, Office of Economic Development, City and County of Denver
- Kristin Toombs, Homeless Programs Manager, Division of Housing, Colorado Department of Local Affairs
- Laura Coddington, Family Advocate, Aurora Housing Authority
- Manuel Lopez del Rio, Community Affairs Coordinator, Denver Mayor's Office
- Melanie Lewis-Dickerson, Improvement Advisor, Community Solutions, Inc.
- Melinda Townsend, Deputy Executive Director of Housing and Family Services, City of Aurora
- Missy Mish, Veteran Services Officer, Denver Department of Human Services
- Nancy Sheffield, Director, Neighborhood Services, City of Aurora
- Norman Brisson, Secretary, Denver Domestic Violence Coordinating Council
- Paul Washington, Executive Director, Denver Office of Economic Development
- Peter Kenny, Founding Principal, Civic Results, Metro Mayors Caucus
- Regina Huerter, Director, Office of Behavioral Health Strategies, City and County of Denver
- Rick Padilla, Director, Housing and Neighborhood Development, City and County of Denver
- Robert White, Denver Police Chief
- Robin Bohannon, Director, Boulder County Community Services
- Scott Cardenas, Chief Information Officer, City and County of Denver
- Scott Gilmore, Deputy Manager, Denver Parks & Recreation
- Scott Strong, Chief, Homeless and Vocational Programs, US Veterans Affairs Medical Center
- Sharan London, VP, ICF International; Leads Homeless and Supportive Housing Team for HUD
- Sharon Duwaik, Program Specialist, City of Aurora
- Shawn Johnson, Director of Community Affairs, City and County of Denver
- Signy Mikita, Community Development Planner, City of Aurora
- Tony Lopez, Commander, Denver Police Department
- Tykus Holloway, Deputy Chief Projects Officer, Denver Mayor's Office
- Tyler Jaeckel, Government Innovations Fellow, City and County of Denver
- Valerie Sanchez, Executive Assistant, City and County of Denver
- Wendy Schwartz, Human Services Planning and Program Development Manager, City of Boulder

Stakeholders

- Alejandro Martinez, Community Representative and Board Member, Metro Denver Homeless Initiative
- Allie Card, Executive Director, Family Promise
- Amanda Trujillo, Communications Coordinator, Metro Denver Homeless Initiative
- Amy Miller, Executive Director, Colorado Coalition Against Domestic Violence
- Amy Pohl, Communications and Membership Director, Colorado Coalition Against Domestic Violence
- Andy Lubansky, Program Director, Mile High United Way
- Angela Bornemann, Executive Director, Access Housing
- Angie Nelson, Partnership's Manager, Denver's Road Home
- Barb Guastella, Program Manager, PACE Team, Mental Health Partners, Boulder and Broomfield Counties
- Ben Robb, Grant Writer, Mile High United Way
- Beverly Cisse, Director, Veteran and Native American Services, Colorado Coalition for the Homeless
- Bill Sweeney, Treasurer, Executive Committee, Boulder Outreach for Homeless Overflow
- Bob Dorshimer, CEO, Mile High Behavioral Health Care/Comitis Crisis Center
- Brad Meuli, President and CEO, Denver Rescue Mission
- Brenton Hutson, Division Director of Veterans Services, Volunteers of America
- Brian Erickson, Veteran Peer, Volunteers of America
- Brittany Bell, Intern, Metro Denver Homeless Initiative
- Caitlin Henkel, Schools Partners Coordinator, Mile High United Way
- Cathy Alderman, Vice President of Communications and Public Policy, Colorado Coalition for the Homeless
- Chelsea Kelleher, Volunteer, Colfax Community Network
- Christie McElhinney, Development Team Member, CLOSE TO HOME
- Christine Benero, President and CEO, Mile High United Way
- Claire Clurman, Executive Director, Attention Homes

- Cori Deterding, Manager, Major Gifts, Mile High United Way
- Deb Bittner, Division Director, Domestic Violence Services, Family Tree
- Deb Butte, Case Manager for Respite Care, Christ's Body Ministries
- Deborah Gray, Housing Manager, Denver's Road Home
- Doug Branstetter, Former Peer Navigator, OUR Center
- Doug Lazatin, 2-1-1 Resource Manager, Mile High United Way
- EJ Becker, PATH Outreach Therapist, Aurora Mental Health Center
- Elbra Wedgeworth, Chief Government and Community Relations Officer, Denver Health Medical Center
- Elissa Hardy, Community Resource Specialist, Denver Public Library
- Elissa Stein, Deputy COO, Jefferson Center for Mental Health
- Elizabeth Freedman, Director of Programs, Emergency Family Assistance Association
- Esther Turcios, Volunteer, Colfax Community Network
- Everett Grove, Residential Supervisor, Aurora Mental Health
- Fermin Avila, Operations Manager, 2-1-1, Mile High United Way
- Gayle Walker, Senior Administrative Assistant, Mile High United
- Geoff Bennett, Vice President, Shelter and Community Outreach, Catholic Charities
- Gordon Davidson, IT Support Specialist, Mile High United Way
- Grace Cerand, AmeriCorps VISTA, Aurora Housing Authority
- Greg Harms, Executive Director, Boulder Shelter for the Homeless
- Harriet Hall, President and CEO, Jefferson Center for Mental Health
- Hazel Dew, Peer Navigator, The Gathering Place
- Heather Beck, Director of Outreach and Engagement, Colorado Coalition for the Homeless
- Ian Fletcher, Senior Project Manager, Veteran Services, Volunteers of America
- Isabel McDevitt, Executive Director, Bridge House
- James Gillespie, Community Impact and Government Impact Liaison, Mile High Behavioral Healthcare
- Jenna Richer, Division Director, Family Tree
- Jerene Petersen, Chief Program Officer, Mile High United Way
- Jessica Rink, Grants Manager and Development Associate, Mile High Behavioral Healthcare
- Joanna Reynolds, Research Analyst: Project Metrics and Evaluation, Colorado Coalition for the Homeless
- Joanne, Colfax Community Network volunteer
- Joe Baker, Data Coordinator, Metro Denver Homeless Initiative
- Joel Cassady, Assistant Development Director/HMIS Site Administrator, St. Francis Center
- John Claybaugh, Community Representative, Metro Denver Mayor's Initiative
- John Parvensky, President and CEO, Colorado Coalition for the Homeless
- Jon Luper, Program Manager, Denver's Road Home
- Jon Mohr, Major Gifts Manager, Mile High United Way
- Joshua Garland, AmeriCorps VISTA, Denver's Road Home
- Judy Lopez, Program Manager, Mile High Behavioral Healthcare and Comitis Crisis Center
- Julie Smith, Denver's Road Home
- Julia Stewart, Vice President of Internal Resources, The Gathering Place
- Justin Beard, Corporate Relations Manager, Mile High United Way
- Karissa Johnson, Intern, Denver's Road Home
- Kaycie Warren, Children's Program Coordinator, Colfax Community Network
- Keith Singer, Program Director, Family Tree
- Kelly Woodard, Runaway and Homeless Youth Outreach Counselor, Mile High Behavioral Healthcare
- Kim Easton, CEO, Urban Peak
- Kim Foust, Executive Assistant to Goebel/ACT and Residential, Mental Health Center of Denver
- Kristen Baluyot, Social Services Program Coordinator, The Salvation Army
- Laura Rossbert, Program Director, The Delores Project
- Leane Vasquez, Peer Navigator, Metro Care Provider Network
- Leslie Foster, President and CEO, The Gathering Place
- Leslye Barringer, Data Analyst, Family Tree
- Linda Barringer, Housing Supervisor, Family Tree
- Lindi Sinton, Vice President of Program Operations, Volunteers of America
- Lisa Searchinger, Executive Director, HOPE
- Lu Horner, Retired Program Administrator, Colorado Department of Human Services; Community Representative, MDHI
- Mae Washam, Community Representative; Volunteer, Family Tree
- Mandy Graves May, Vice President of Quality Assurance, Colorado Coalition for the Homeless
- Margarita Ruiz, Program Manager, Mile High United Way
- Marshall Harris, AmeriCorps VISTA, Metro Denver Homeless Initiative
- Maryjane Carr, AmeriCorps VISTA, Family Tree; Board Member, Metro Denver Homeless Initiative
- Matt Mollica, Clinical Case Manager, Colorado Coalition for the Homeless
- Megan Vizina, Executive Director, Colfax Community Network
- Michelle Jeske, Denver City Librarian, Denver Public Library
- Milla McLachlan, Chief Learning Officer, Rapid Results Institute

- Nathan Davis, Manager, Programs and Grants Administration, Mile High United Way
- Olga Garcia, Manger, Community Relations/Diversity and Inclusion
- Randle Loeb, Community Representative
- Rebecca Mayer, Program Coordinator, Metro Denver Homeless Initiative
- Renee Crews, Homeless Systems Outreach Coordinator, Denver's Road Home
- Rochelle Brogan, Former Peer Navigator, Volunteers of America and The Gathering Place
- Roweena Naidoo, Director, Policy and Economic Success, Mile High United Way
- Sandra Blythe-Perry, Executive Director, Integrated Family Community Services
- Sarah Hamilton, Executive Director, Aurora Warms the Night
- Sarah Maxwell, Executive Director, Stride
- Scott Shields, Chief Executive Officer, Family Tree
- Shehila Rae Stephens, Volunteers of America; Board Member, Metro Denver Homeless Initiative
- Shelly Hines, Family Safety Net Director, Jewish Family Service
- Stephanie Sanchez, 2-1-1 Statewide Director, Mile High United Way
- Steve King, Manager of Workforce Development and Postsecondary Success, Mile High United Way
- Stevi Gray, Housing Program Manager, Colorado Coalition Against Domestic Violence
- Taylor Vitale, Major Gifts Manager, Mile High United Way
- Terrell Curtis, Executive Director, The Delores Project
- Tirzah Stein, Social Worker, Colfax Community Network
- Tom Luehrs, Executive Director, St. Francis Center
- Vicki Rodgers, Vice President, Corporate Integrity, Mental Health Partners

Outside business associates

- Jill Spangler, Consultant/Associate, Abt Associates
- Natalie Mathews, Consultant/Associate, Abt Associates

The IBM Smarter Cities Challenge team would also like to acknowledge the contributions of numerous people on the street who are currently experiencing homelessness.

B. Team biographies



Matthew Terribile
Senior Project Manager for Analytics
and Operations
IBM Competitive Project Office

Matthew Terribile is a Senior Project Manager for Analytics and Operations within the IBM Competitive Project Office. He has more than 27 years of experience, including nine years in management and 17 years in project management. In his career, Terribile has provided leadership in business operations, process improvement, sales support, vendor management, website development, software maintenance and deployment and hardware development. He holds degrees in electrical engineering, industrial engineering and business administration and is a Project Management Institute certified Project Manager. He lives in Raleigh, North Carolina, with his wife. He has volunteered with many nonprofit organizations, including those providing shelter, mentoring, day services and youth development.



Greg Souchack
Partner and Service Line Leader
IBM US Federal Global Business
Services Infrastructure

Greg Souchack is a Partner and Service Line Leader for the IBM US Federal Global Business Services Infrastructure organization. He received a Bachelor's degree in actuarial science from Penn State University in 1999 and spent the first four years of his career working as a pension valuation actuary. In 2004, Souchack joined IBM as a Project Manager on a program with the US Department of Homeland Security. In his current role, he manages a team of 500 employees and has delivery responsibility for US Federal Community Clouds from IBM. Souchack is on the Board of Directors of Carpenter's Shelter in Alexandria, Virginia. He and his wife Valerie have two children.



Julie McDougal
Senior Human Resources Manager
Human Resources Business Partner

Julie McDougal is a IBM Senior Human Resources Manager. She has more than 30 years of experience with IBM and brings expertise as an IBM Senior Manager of Technical Services, managing education for IT and consulting, along with leading strategy and operations teams. In her current role as HR Business Partner, McDougal provides HR advice and counsel to more than 100 executives and managers across hardware, software, enterprise and commercial sales teams. She focuses on bringing personnel and business value to all through career and business development, innovation, performance management, HR process/tools guidance and overall personnel coaching. She has a Master's degree from Drake University. McDougal is married, has one daughter and resides in Des Moines, Iowa. Over the years, she has volunteered for several nonprofit organizations, most recently for those focused on homeless and underprivileged youth.



Mark Hennessy
General Manager, Retired

Mark Hennessy recently retired from IBM after a 30-year career. During his tenure with IBM, Hennessy was General Manager for several IBM businesses, including the Asia Pacific Systems business based in Tokyo, Japan, the European business based in Zurich, Switzerland, and the Global Distribution Sector based at IBM corporate headquarters. Hennessy also held several IBM executive staff assignments, including Global Chief Information Officer and GM of Strategy and Sales Transformation.

Hennessy is a board member of Covenant House International, which serves more than 50,000 homeless and trafficked youth in 27 cities throughout six countries. He has been a member of the board for six years and in that time has led several board activities, including strategic planning, program evaluation and site expansion. Hennessy received Covenant House International's Beacon of Hope award in 2014.

Hennessy has an undergraduate degree from Boston College and an MBA from the University of Chicago's Booth School of Business. He and his wife Tracey have two children and reside in Siesta Key, Florida, and Breckenridge, Colorado. They are involved in a number of community activities.



Janet Felletter
Global Leader
IBM Software Sales Business Operations
and Outsourcing Software Sales

Janet Felletter is the global leader for IBM Software Sales Business Operations and Outsourcing Software Sales. She manages a global organization that provides world-class operational support to software sellers, business partners and clients. Felletter brings a wealth of knowledge in strategy and transformation from her experience across business units and functions during her 22-year career with IBM. She was proud to represent IBM in Romania with the Corporate Service Corps in 2009. She has an MBA from the University of Florida and is a Certified Management Accountant. Felletter lives in Tampa, Florida, with her husband and two children. She is an active volunteer within the Tampa community and has served in leadership positions with several organizations supporting education.

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