3. NEEDS AND STRATEGIES

The prior chapters have described characteristics of different passenger transportation systems, as well as the challenges that Iowa's public transportation system is experiencing. Information on gaps and needs within the public transit system itself will be covered in this chapter in order to produce a comprehensive operational picture of the current situation. Once the needs are identified, strategies addressing them can be applied in order to influence the transit system in such a way that it aligns with the goals of this Plan.

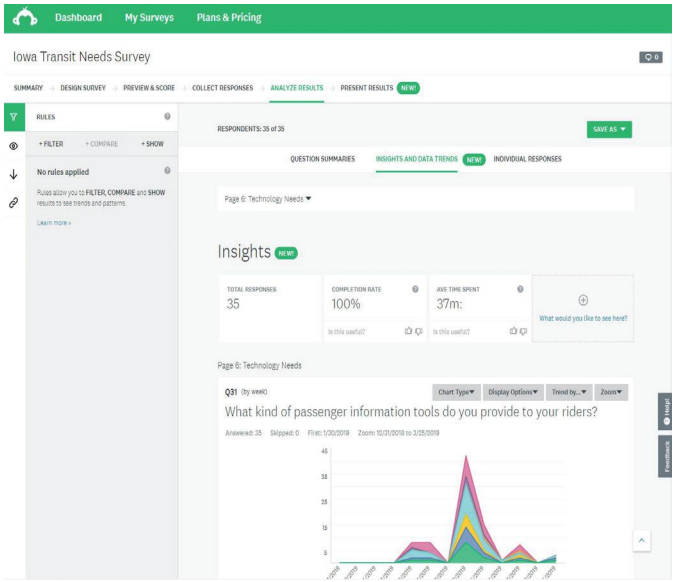
3.1. Needs Assessment and Gap Analysis

One of the steps of the planning process was to identify the existing and forecasted needs of the public transit system. Afterall, a solution cannot be applied until the problem is first fully understood. The needs assessments and analyses not only result in solutions and strategies, but also provide tangible metrics with which to begin estimating the costs associated with them. Further discussion on costs and the financial analysis will be covered in Chapter 4.

Transit Needs Survey

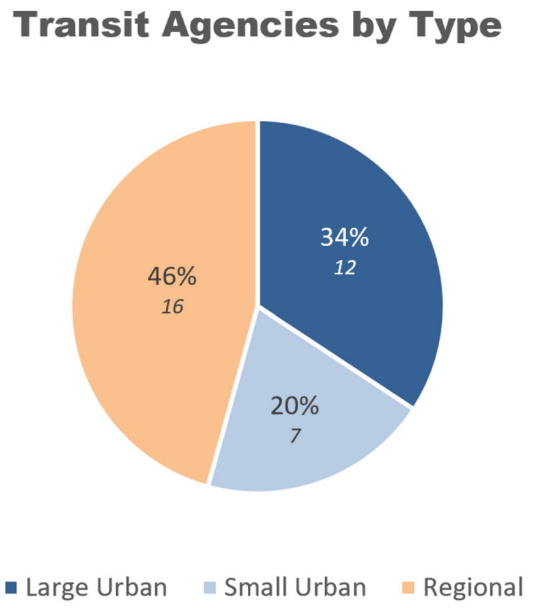
Understanding the needs of the public transit system requires detailed knowledge of how it operates. For this reason, the first effort to assess these needs relied upon input from all transit agencies in Iowa.

Immediately after the launch of the Iowa Public Transit Long Range Plan effort in December 2018, the Plan's working group began drafting a set of questions for the transit agencies to answer through a survey. The purpose of this survey was to identify gaps or needs in public transit services throughout the state. These needs were then analyzed and incorporated into the Plan.



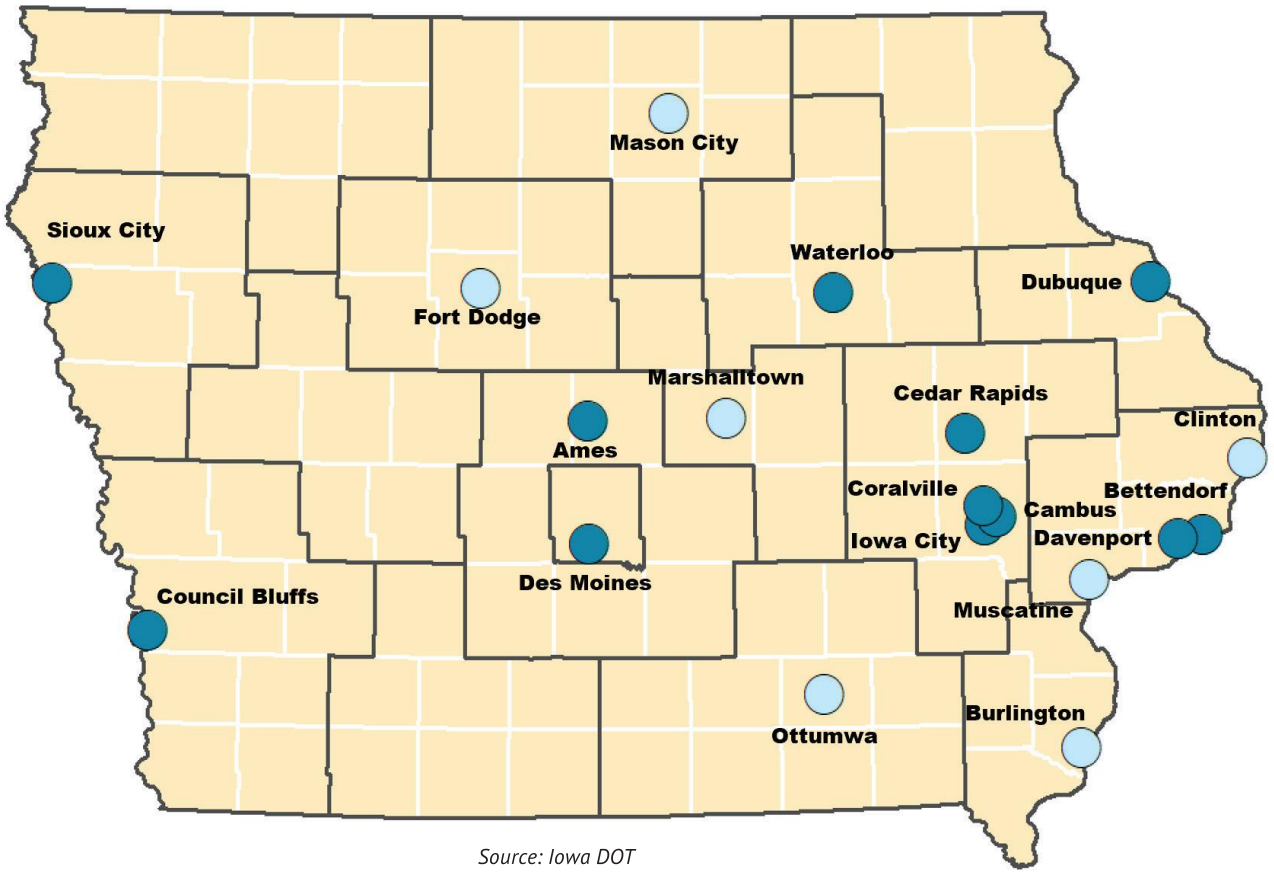
An online platform was utilized to conduct the needs assessment and the survey was open from February 1 through March 29, 2019. All 35 Iowa transit agencies responded to the survey.

When possible, results were aggregated by transit agency type: large urban, small urban, or regional (see Figure 3.1).



Large Urban: greater than 50,000 population
Small Urban: 20,000 - 49,999 population
Regional: Rural areas outside Urban

Figure 3.1: Transit agencies by type



Source: Iowa DOT

The survey questions were organized into several different sections based on the type of need. The sections included:

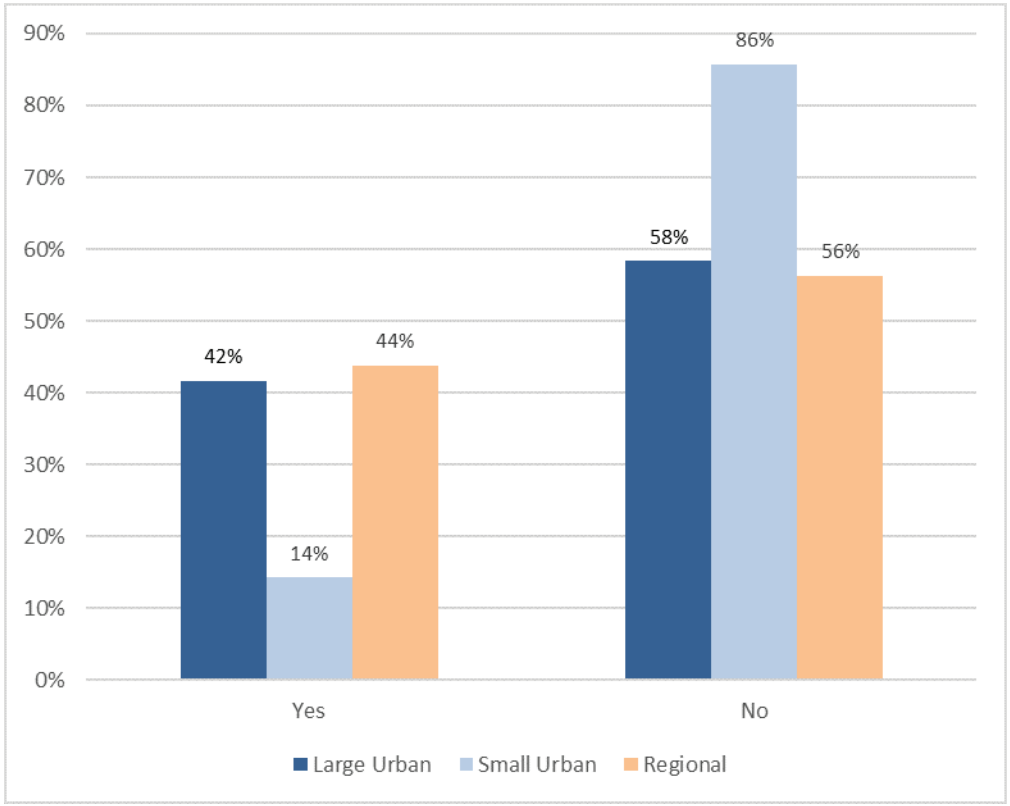
- **Section 1:** Agency Information
- **Section 2:** Service Needs
- **Section 3:** Fleet Needs
- **Section 4:** Facility Needs
- **Section 5:** Personnel Needs
- **Section 6:** Technology Needs

Section 1: Agency Information

The first section of the survey was intended to validate agency contact information, as well as to ask a series of general questions about the agency itself. These questions were useful information to gather as they provided additional context for understanding how the transit agencies operate and communicate.

One fact that quickly became clear was a general lack of long-range or strategic planning efforts. As seen in Figure 3.2, most agencies do not conduct planning to this extent. This was also evident through the difficulties that some agencies experienced when trying to forecast needs out to 2030 and 2050. Open-ended comments supplied in each survey section indicated this as well. The overall lack of long-range strategic planning serves as further evidence that this Public Transit Long Range Plan is needed.

Figure 3.2: Percentage of transit agencies that have conducted strategic planning



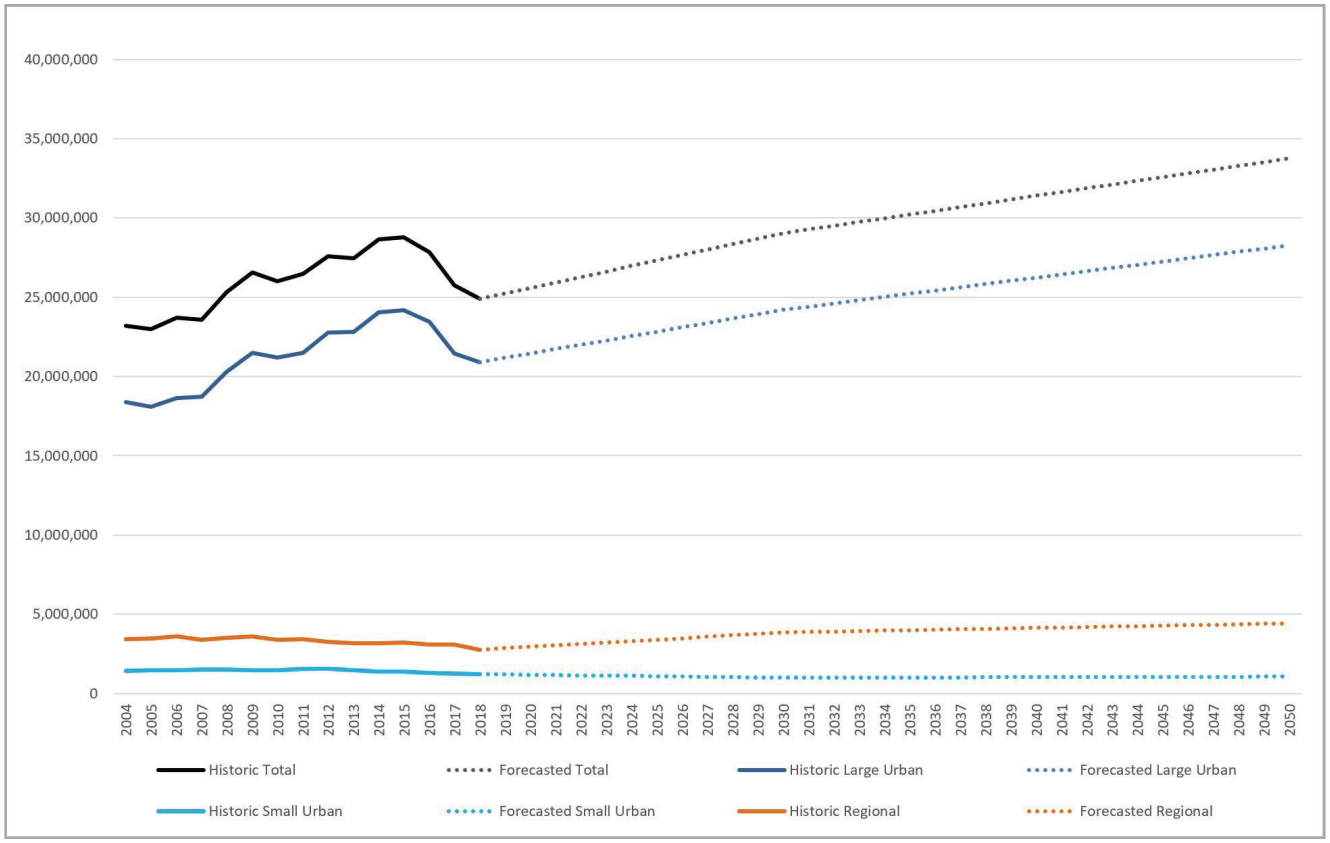
Source: Iowa DOT

Section 2: Service Needs

Service needs are defined as unmet demand for specific components of public transit service. Needs could be gaps in service area, frequency, or time periods that service operates; or a lack of options such as express routes (routes with few stops or transfers), paratransit (service for individuals with disabilities), or demand response (pre-scheduled trips with no set stops).

Figure 3.3 represents historically reported ridership numbers and projected future ridership levels based on survey responses. This clearly shows a decrease of ridership from its peak around 2015 through the present. There are multiple factors that may help explain this decline. During that time period, Transportation Network Companies (TNCs) such as Uber and Lyft began expanding in Iowa's urban areas, which attracted some ridership from public transit. Additionally, changes in how Medicare medical transportation is contracted through Iowa's Managed Care Organization (MCO) providers resulted in a significant number of riders being diverted from public transportation to private or alternative means of transportation. Despite the recent decreases in public transit ridership, transit agencies are projecting long-term growth in ridership. Agencies were asked to estimate their ridership in 2030 and in 2050; as shown on Figure 3.3, agencies are projecting slightly higher growth in ridership from now to 2030 compared to 2030 to 2050. This may represent some of the long-term uncertainty of the relationship of public transit to TNCs and other possible transportation developments, such as autonomous vehicles.

Figure 3.3: Iowa transit agency ridership, historical and forecasted

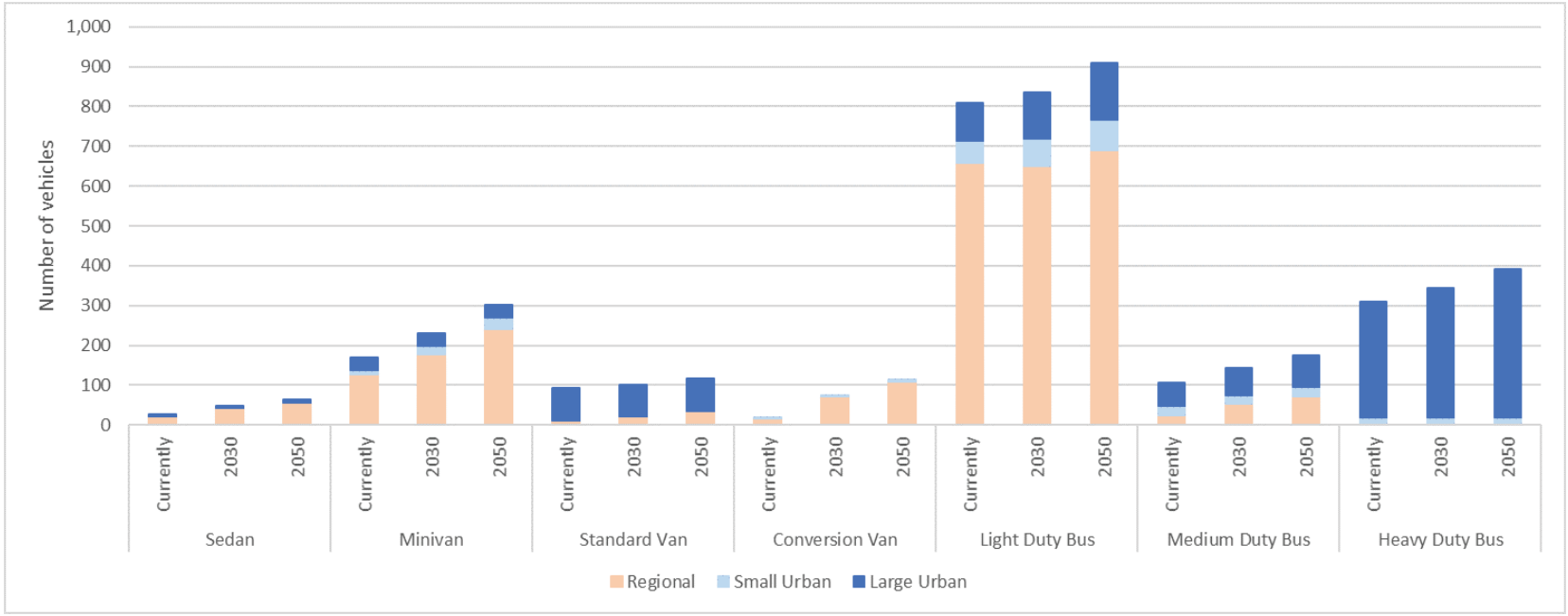


Source: Iowa DOT

Section 3: Fleet Needs

Fleet needs relate to revenue vehicles, which are a transit agency's bus and van fleet that is utilized to transport riders. This does not include vehicles used by office personnel or for non-public transportation purposes such as maintenance trucks. Vehicle fleet needs represent a constant challenge as this includes replacing existing vehicles that are beyond their useful lives, as well as projecting future needs for additional vehicles, called expansion vehicles since they increase the overall fleet size. In general, transit agencies are exploring the "rightsizing" of their fleet in order to have appropriately-sized vehicles for the likely number of riders. In some situations, there may only be one or two riders, so it would not make as much practical sense to utilize a heavy duty bus to transport them. Instead, a smaller van would be a more appropriate and comfortable fit. On the other hand, fixed-route services or contracted employee transportation services may require a bus that can hold 20 or more people at once. Figure 3.4 shows the varying vehicle needs between the different types of transit agencies, by showing the estimated additional vehicles needed by 2030 and by 2050 on top of their current vehicle fleets. Note that large urban systems typically focus on fixed-route service which transports larger numbers of people for shorter distances, while regional systems generally transport fewer numbers of people over longer distances. Additionally, many systems are exploring the use of vans to augment or replace larger buses.

Figure 3.4: Transit agency current vehicle fleets and additional vehicle needs by 2030 and 2050



Source: Iowa DOT

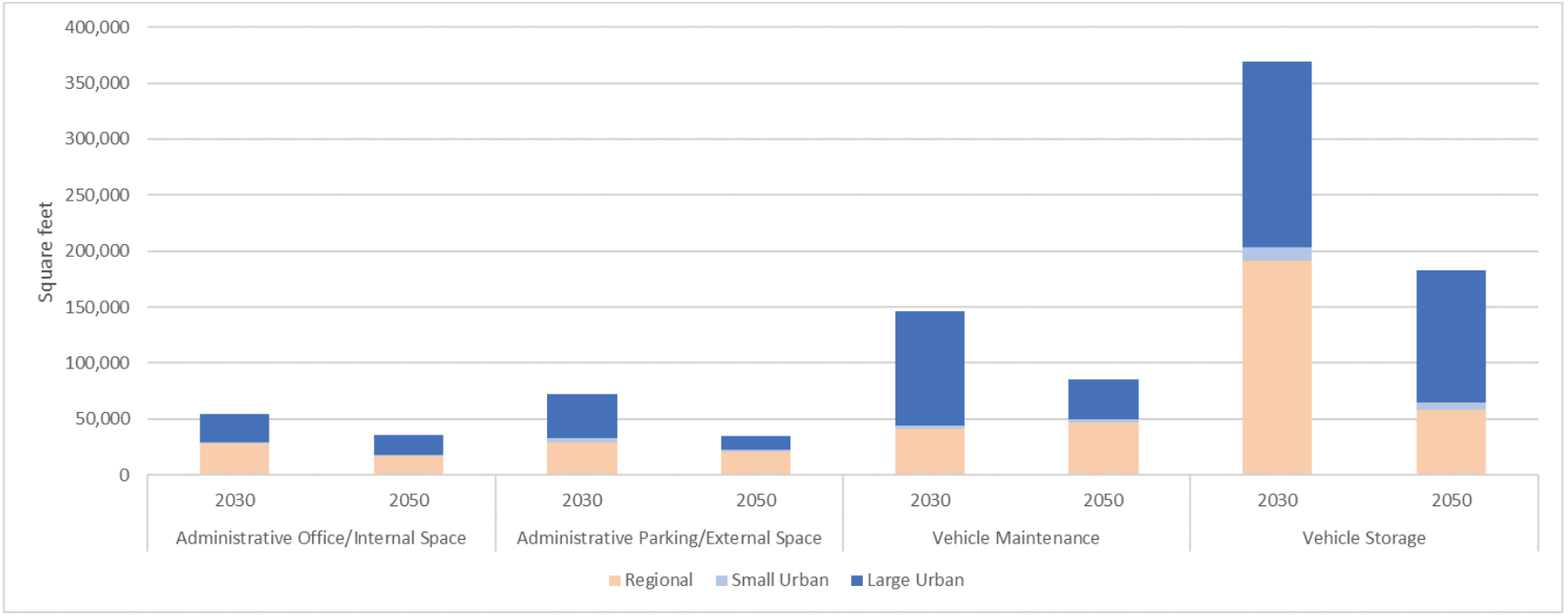
Section 4: Facility Needs

Facility needs include maintenance areas (including wash racks and wash bays), revenue vehicle storage areas, administrative/offices (including building needs such as offices/storage space and site needs such as parking spaces and walkways), and park and ride facilities.

Typically, the larger the vehicle size, the more expensive it is to fix and replace. In order to extend the lives of these expensive vehicles, it is best to protect them to reduce maintenance costs and wear-and-tear of the buses. Extending the longevity of the bus fleet was reflected as one of the more significant needs for additional revenue vehicle storage. Maintenance facilities for the fleet were also identified as a need; however, it was significantly lower compared to storage needs. Administrative offices and parking space were also notably lower in need compared to other types of facilities.

Figure 3.5 displays the survey results for facility needs. Besides the need for particular types of facilities, the time period in which they are needed displayed another trend. Nearly all facility needs were identified in the short-term planning horizon of 2030, with additional facility needs significantly lower in the long-term by 2050. This shows that additional facilities, particularly for vehicle storage, are a higher priority and a more immediate need.

Figure 3.5: Transit agency additional facility needs by 2030 and 2050 (square feet)



Source: Iowa DOT

Transit agencies had varying needs for bus shelters and park and ride lots. Regional systems had a slight need that increased very little between 2030 and 2050, as shown in Figure 3.6. Large urban systems showed the greatest change between 2030 and 2050, with much more need for both types of facilities. Small urban systems saw an increase for bus shelters in the short-term by 2030 with a similar need by 2050, but saw no need for additional park and ride facilities.

Figure 3.6: Bus shelter and park and ride additional facility needs by 2030 and 2050 (number of shelters/lots)

	Bus Shelters		Park & Ride	
	2030	2050	2030	2050
Regional	4	6	9	10
Small Urban	16	15	0	0
Large Urban	203	317	13	22

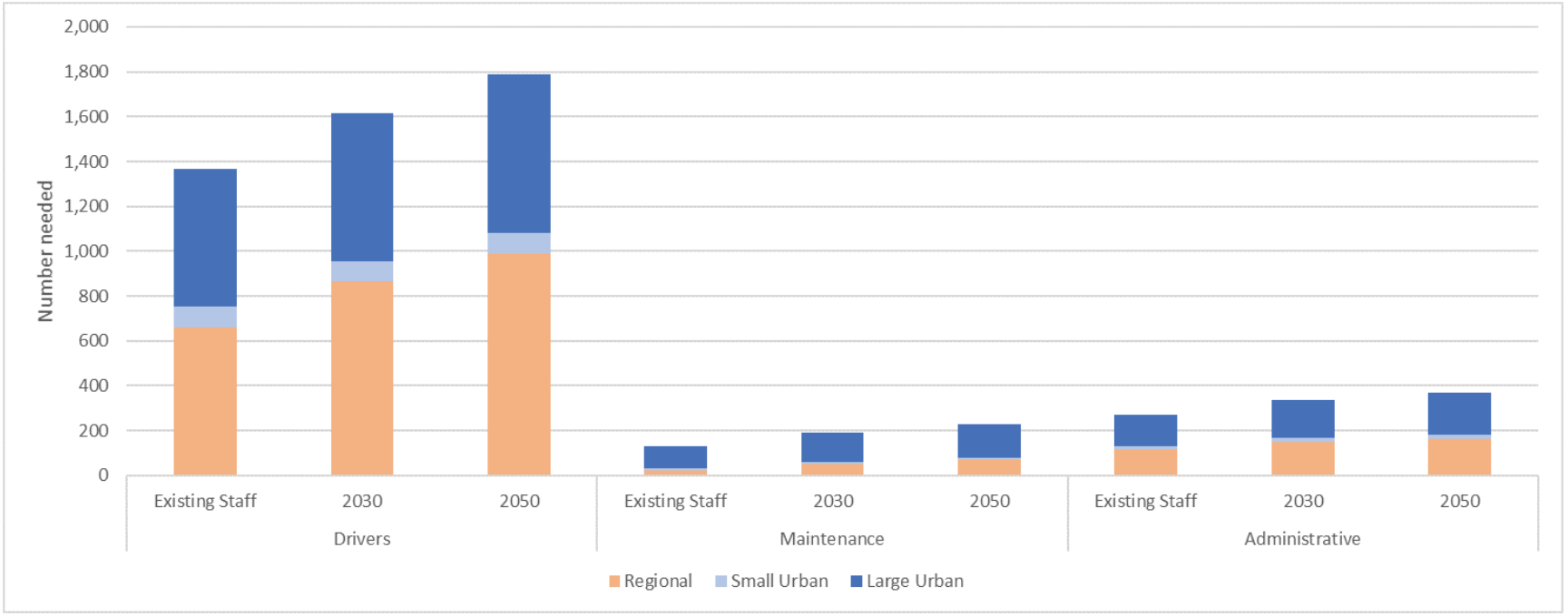
Source: Iowa DOT

Section 5: Personnel Needs

Personnel needs relate to the workforce of the transit agency. This includes drivers, maintenance, and administrative staff. All types of transit agencies expressed current personnel needs as well as ongoing needs for additional drivers, maintenance staff, and administrative or office staff (see Figure 3.7). However, the need for more bus drivers represents the single greatest personnel need across the state. In some situations, the need for drivers is so significant that dispatchers, maintenance personnel, and even agency directors attempt to fill the gap by driving a limited number of routes and picking up on-demand transit calls.

A lack of drivers will have the effect of limiting the level of transit service that is available in a given region. It does not matter how many buses or vans are available if there are not sufficient numbers of qualified and licensed drivers to operate them. Likewise, a lack of maintenance employees may impact the ability to service and sustain the fleet of vehicles available for transit service, while a lack of office staff will handicap the agency's ability to conduct public outreach, market its services, or perform strategic planning or analyses.

"Figure 3.7: Transit agency current personnel and additional personnel needs by 2030 and 2050



Source: Iowa DOT

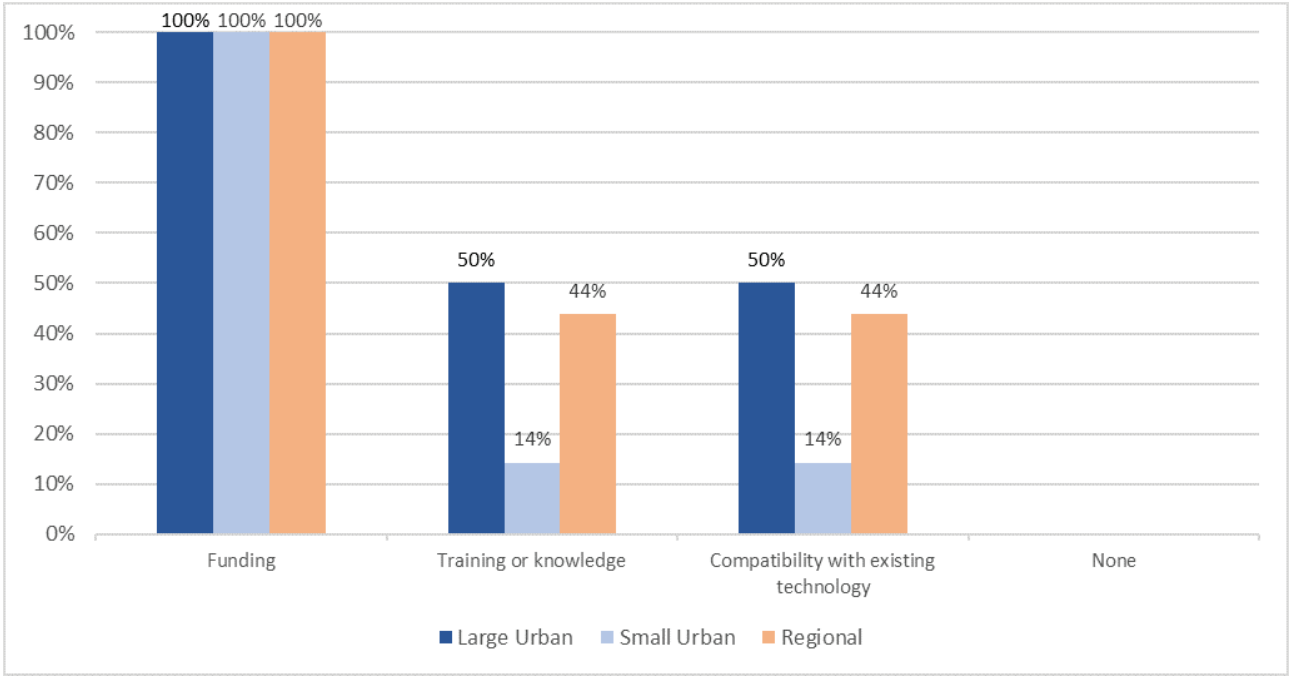
Section 6: Technology Needs

Technology needs relate to hardware or software capabilities within vehicles, as well as those utilized by administrative staff in the office.

Transit agencies utilize a wide range of tools and technologies in order to keep the transit system operating. From dispatching, to route optimization software, hybrid buses, and live geolocating services and apps, there are many different aspects of running transit operations that are impacted by the rapid pace of changing technology. Along with that, there are rapidly changing expectations of potential riders that make it difficult for transit agencies to simultaneously manage current operations while researching and implementing new technological approaches.

As shown in Figure 3.8, it is clear that the most significant barrier to implementing new technology is funding. Some of the comments from the agencies provided additional context to this. Several made mention of the difficulty in determining the overall cost of technology, such as predicting training costs, subscription services, and long-term licensing agreements. While most agencies expressed interest in adopting new technology, there was even more interest in understanding its return-on-investment. In other words, they would like to understand what the overall costs entail, including lost opportunity costs, in relation to cost savings or some other tangible benefit.

Figure 3.8: Barriers preventing transit agencies from acquiring or leveraging technology



Source: Iowa DOT

Transit Dependency Analysis

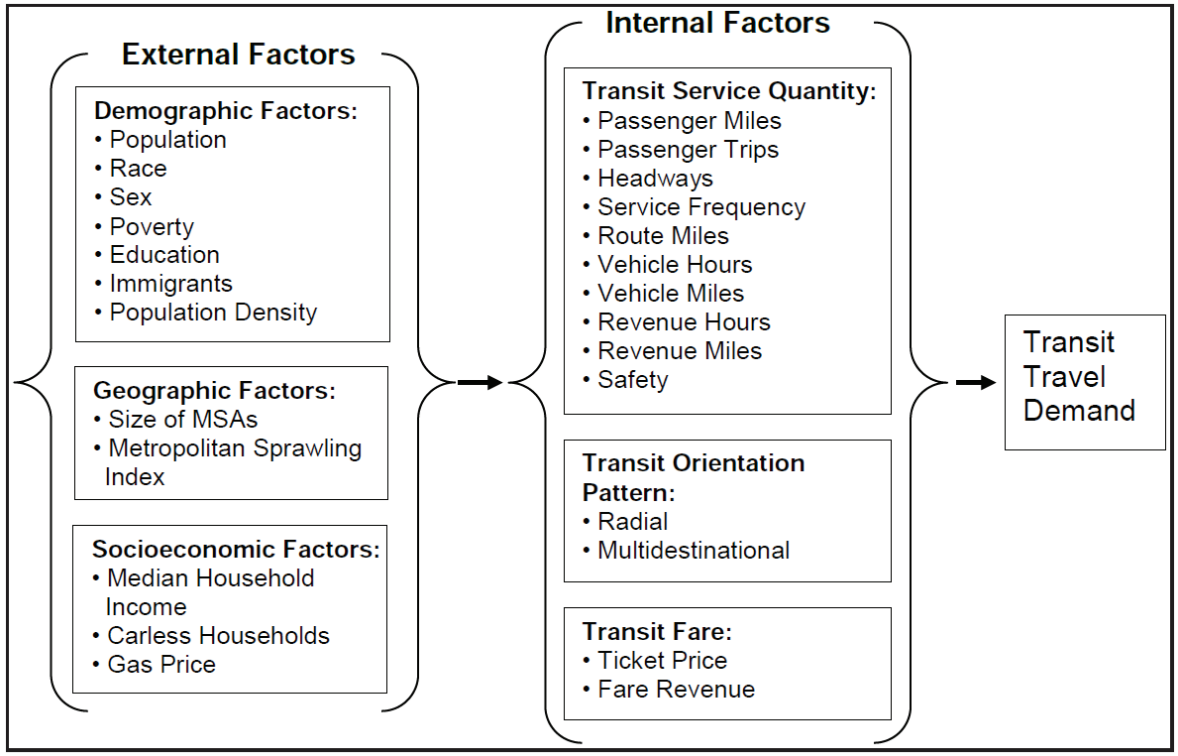
Background

Determining needs and assessing the public transit system for gaps and issues occurred early in the planning process. While the Transit Needs Assessment survey was being completed by the transit agencies in March 2019, additional analysis was being done to forecast or predict the locations of "hot spots" where transit need or dependency was highest in Iowa. After a literature review of multiple studies on the topic, a study by the Mineta Transportation Institute from San José State University (SJSU) was utilized as the basis for a transit dependency analysis in Iowa.

This study, titled "Investigating the Determining Factors for Transit Travel Demand by Bus Mode in US Metropolitan Statistical Areas[16]", shared several common themes that were reproduced for the purposes of this Plan, including:

- Predicting areas of transit need
- Not relying on ridership statistics or other reported transit data
- Utilizing general characteristics, universally applied throughout the entire study area

Figure 3.9: Internal and external factors



Source: Adapted from Taylor et al. (2009) and Thompson and Brown (2006).

Source: Mineta Transportation Institute

16 "Investigating the Determining Factors for Transit Travel Demand by Bus Mode in US Metropolitan Statistical Areas", Mineta Transportation Institute, San José State University, May 2015. https://transweb.sjsu.edu/research/investigating-determining-factors-transit-travel-demand-bus-mode-us-metropolitan

Selection of Factors

While the overall goals of the Mineta study were the same with regards to identifying transit dependent areas in Iowa, the factors utilized in the study needed to be evaluated and adapted in order to tailor them to better suit Iowa.

Internal versus External Factors

The original study divided the list of factors into internal and external factors. Internal factors were described as characteristics that are directly controlled by transit agencies. As Figure 3.9 shows, these factors primarily consist of things like bus fares, hours of service, frequency of routes, and the type of routes traveled (i.e., a circular ring-route, multi-stop route, or express route).

External factors, on the other hand, are characteristics that describe the relationship between demographic and economic factors and transit ridership. These attributes cover a spectrum of areas including household income, fuel prices, metropolitan sprawl, and other socioeconomic characteristics.

Methodology

For the purposes of this Plan, only external factors were leveraged for the transit dependency analysis. This was mainly due to the fact that internal factors can vary greatly across different regions and transit agencies, making it nearly impossible to evaluate and describe the entire state under one universal set of characteristics. Additionally, several factors from the original study were removed or adjusted due to their limited applicability to Iowa or redundancy with other factors.

After the factors were selected and adjusted, the next step was to gather the necessary data in order to conduct the analysis. After reviewing the available datasets, it was determined that most of the factors could be described in terms of U.S. Census Block Groups. This was the smallest, most granular geographic unit that most of the factors could be attributed to. The only exception was for gas prices due to the limited availability of this information. As such, gas prices were determined at the county-level instead of block group. Figure 3.10 shows the seven factors used in the transit dependency analysis and their definitions.

Figure 3.10: Transit dependency factors

Factor	Scale	Description
Gas Prices	County	Average gas prices from AAA web site with samples taken between June and November 2019. O'Brien County data from Gas Buddy website (not available from AAA).
Median Household Income	Block Group	Median household income for the block group.
Carless Households	Block Group	Percentage of households with zero vehicles available.
Language	Block Group	Percentage of households where English is spoken "not well" or "not at all."
Race	Block Group	Percentage of households not classified solely as "White."
College Enrolled	Block Group	Percentage of households with occupants enrolled in "college, undergraduate, graduate or professional school."
Population Density	Block Group	Density of population per square kilometer (land area only – water area not included).

Sources: U.S. Census Bureau; AAA; Gas Buddy

Once data for the factors was gathered, it was rendered in a Geographic Information System (GIS) map. This mapping software allowed for detailed analysis of the individual factors as layers of information that could then be summarized and compiled into a single overlay to represent transit dependency in different areas of the state. Statewide averages for each of the factors were used as a threshold by which each area could be determined to be more or less transit dependent for that factor. For each factor, a scale of one through ten was applied with a value of ten being all values that were equal to or less transit dependent than the statewide average. All remaining block groups were divided into nine categories with an equal number of remaining block groups in each of the nine categories. This enabled the comparison of factors based on a normalized scale rather than each individual factor's data range.

A layer, with a one through ten score for each block group, was generated corresponding to each of the seven individual external factors used in the analysis. All the individual layers were then compiled in order to generate an overall composite layer that identifies the most transit dependent areas based on these seven factors. Since it is likely that not all factors contribute equally when it comes to influencing transit dependency and ridership, they needed to be weighted to reflect the level of influence of each factor.

The transit agencies were asked to help provide this information by supplying a set of scoring values for each of the seven factors, based on their background, experience, and perspective. The higher the value assigned to the factor, the more weighting or influence was given to that particular factor. Lower values for a factor indicate less influence on transit dependency. Results were averaged first by transit agency type then across all agencies together, as shown on Figure 3.11.

These results were input into GIS. The scores for each factor were multiplied by that factor's weight, then all individual weighted layers were added together. Figure 3.12 depicts the result based on the average weights for each factor as determined by the transit agencies.

Application

The value of performing this analysis is in realizing the complex relationship between multiple factors and how they contribute to transit dependency. Regardless of whether a transit system is in an urban or rural area, a transit agency can review these results and see where there are populations that may be more likely to be dependent on that transit system for transportation. This allows for focused discussion on how to address those potential needs.

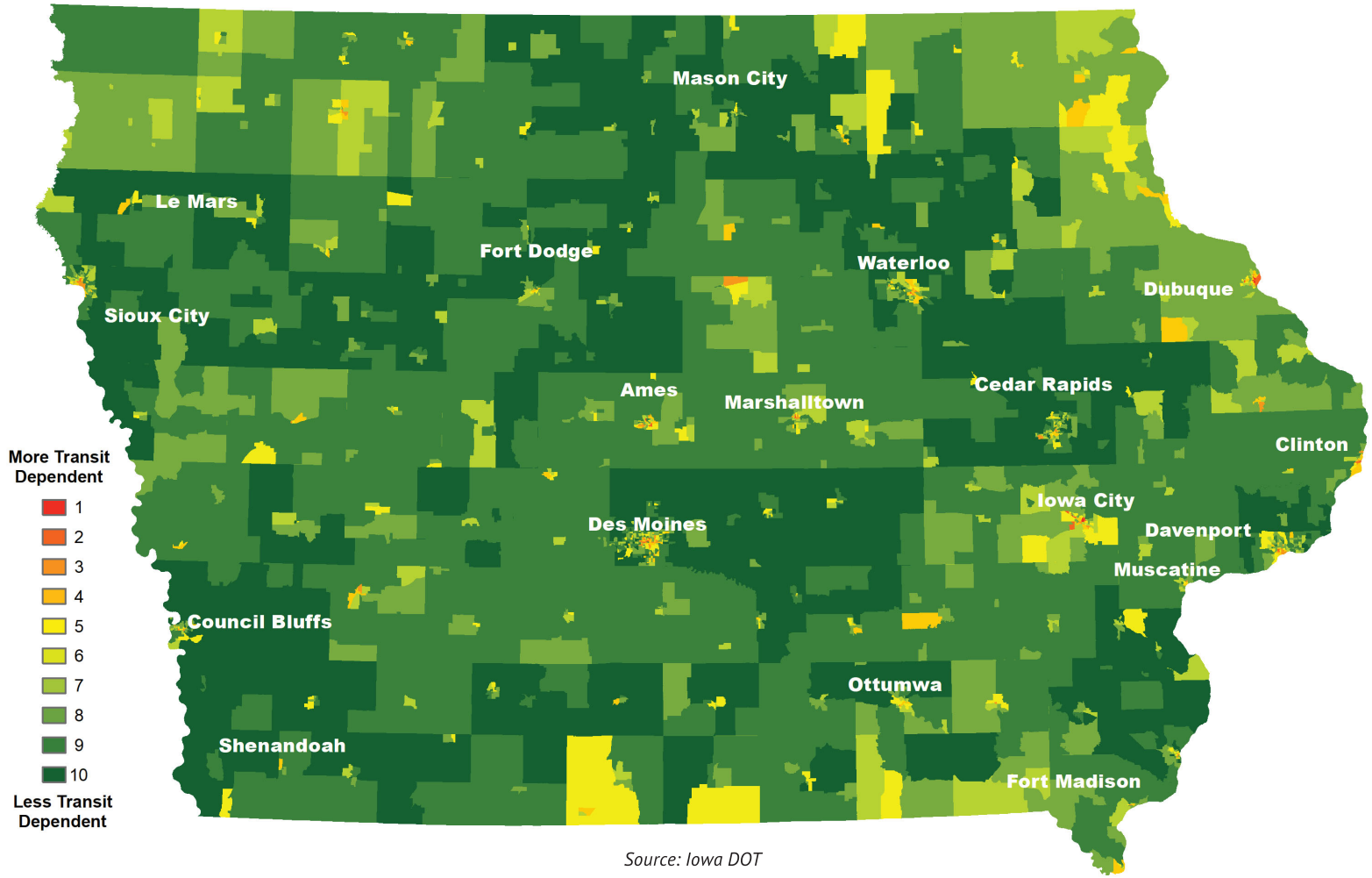
In the case of this analysis, one size does not fit all. Different strategies can be leveraged based on the combination of the individual factors in the region that are flagged as more transit dependent. Just because an area is "more transit dependent" does not necessarily mean that routes or schedules need to change, which could be quite costly for the transit agency.

Figure 3.11: Weighting feedback from transit agencies

	Final			
Factor	*Large Urban*	*Small Urban*	*Regional*	All
1. Gas Prices	15	10	20	20
2. Household Income	25	30	20	20
3. Carless Households	25	40	30	30
4. Language	5	5	5	5
5. Race	5	5	5	5
6. Enrolled in College	10	5	5	5
7. Population Density	15	5	15	15

Source: Iowa DOT

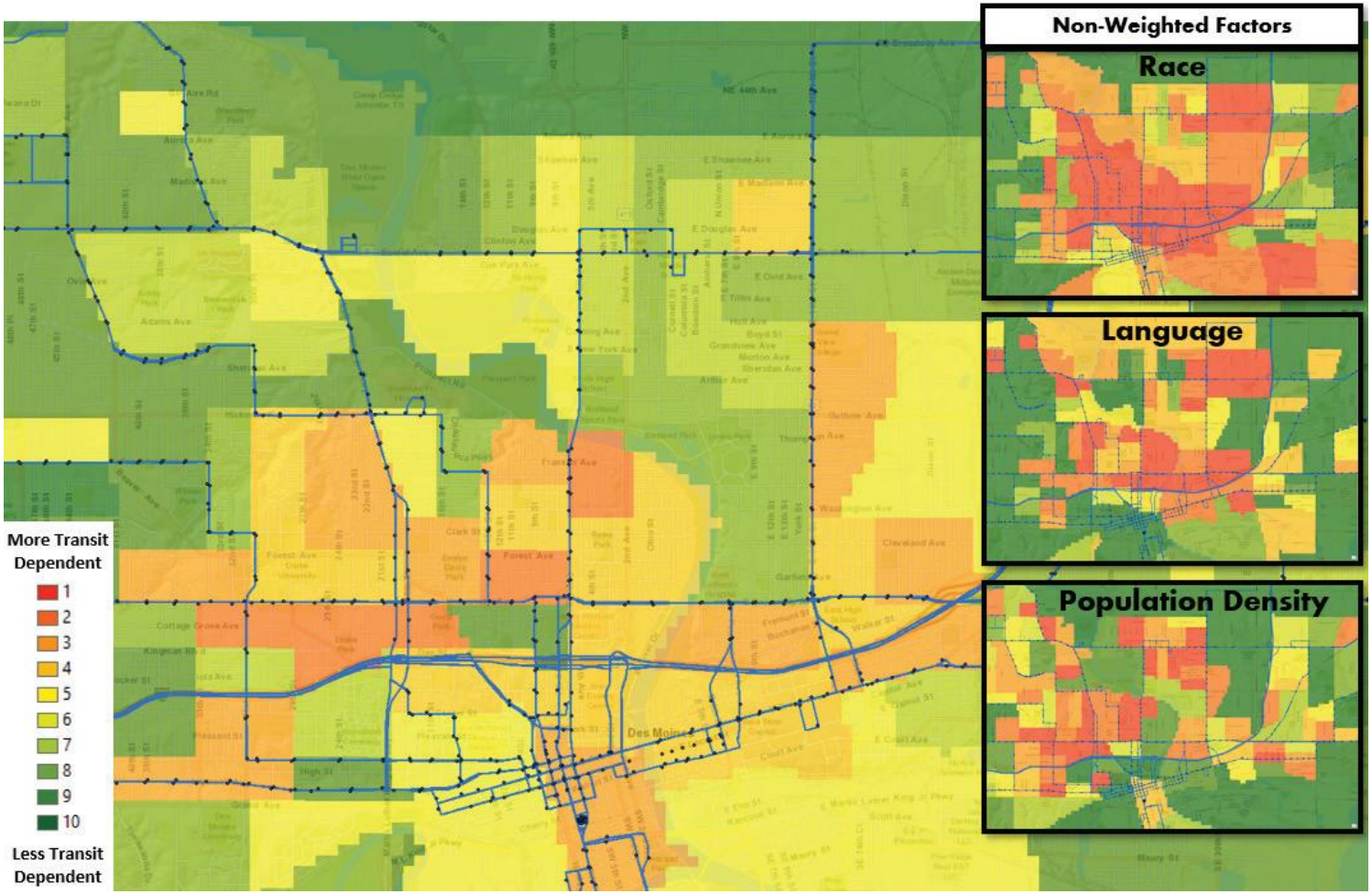
Figure 3.12: Composite transit dependency weighted by all transit agency results



Source: Iowa DOT

By examining the individual factors in transit dependent block groups, an agency can tailor the appropriate response and potentially achieve the end goal of serving additional riders in those areas. Figure 3.13 illustrates this for the Des Moines area, with bus routes and stops overlaid on top of block groups identified as being more transit dependent based on the composite result. The individual, non-weighted factors can also be used as a reference to better understand an area's characteristics in order to tailor appropriate strategies.

Figure 3.13: Des Moines area example comparing individual weighted factors and bus routes



Source: Iowa DOT

3.2. Strategies

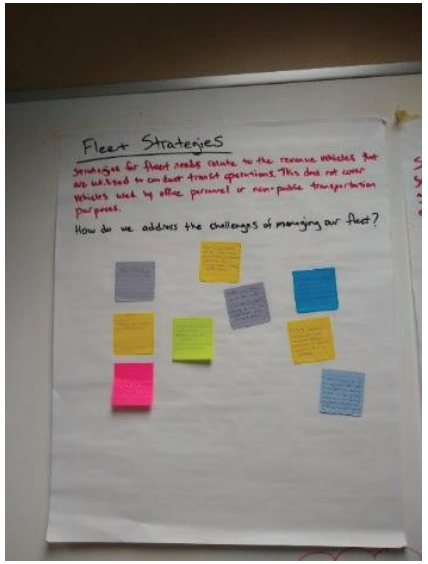
In order to carry out the vision of the public transit system and address the needs that were identified during the planning process, strategies have been identified for several areas that would help implement this Plan. The strategies that are listed in this section were derived from existing plans (such as the State Transportation Plan and MPO/RPA Passenger Transportation Plans) and input from stakeholders, the Iowa Transportation Commission, and the general public.

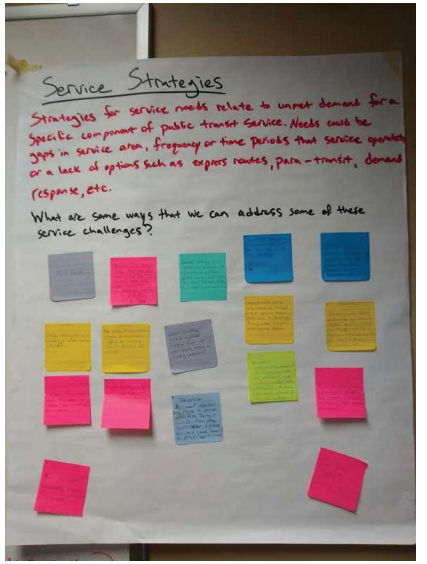
Strategy identification and development

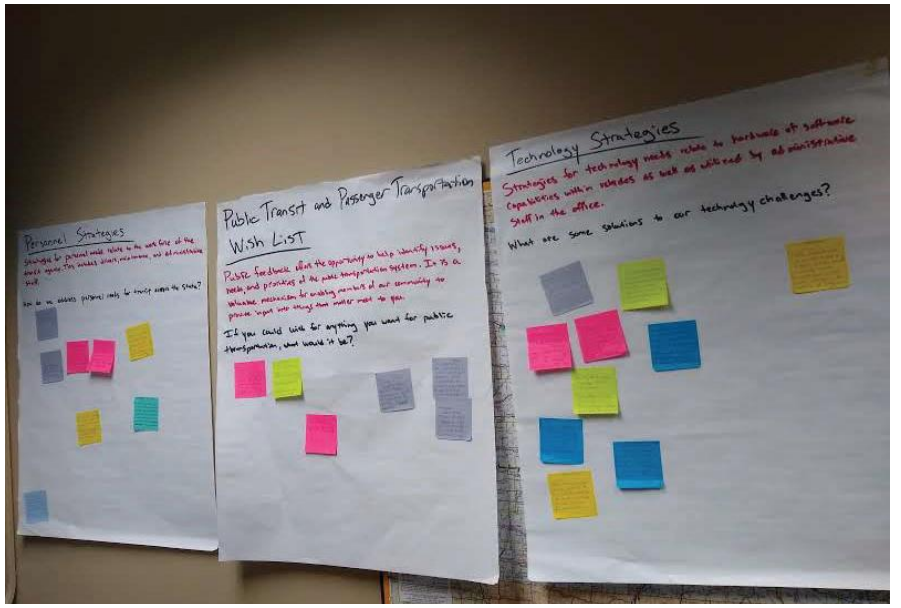
As described in Section 3.1, public transit system needs were among the first items to be collected and analyzed. The results of this needs assessment were initially presented to transit agencies at the Iowa Public Transit Association (IPTA) Legislative Conference in April 2019. After sharing the aggregated results from the transit needs survey, a brainstorming exercise was introduced to the group in order to solicit feedback and begin accumulating ideas and possible strategies for addressing those needs. Each participant had the opportunity to identify ideas or strategies for the five categories of needs – service, fleet, facility, personnel, and technology.

The same approach was utilized in May 2019 for the Passenger Transportation Summit. This conference featured a much broader group of participants, including multiple levels of government, transit agencies, non-profits, human service organizations, and the public. Approximately 60 individual ideas were received.

Strategies were derived from these initial brainstorming exercises and working group input. The result was an initial list of 30 strategies to be considered for inclusion into the Plan and used as a basis to formulate the overall vision and goal areas of the plan. Key themes were extracted from the strategies to determine the frequency of their use, and organized into general categories or goal areas for the plan. These goal areas, and the strategies contained within them, nest under the overall vision for the future of public transit in Iowa.







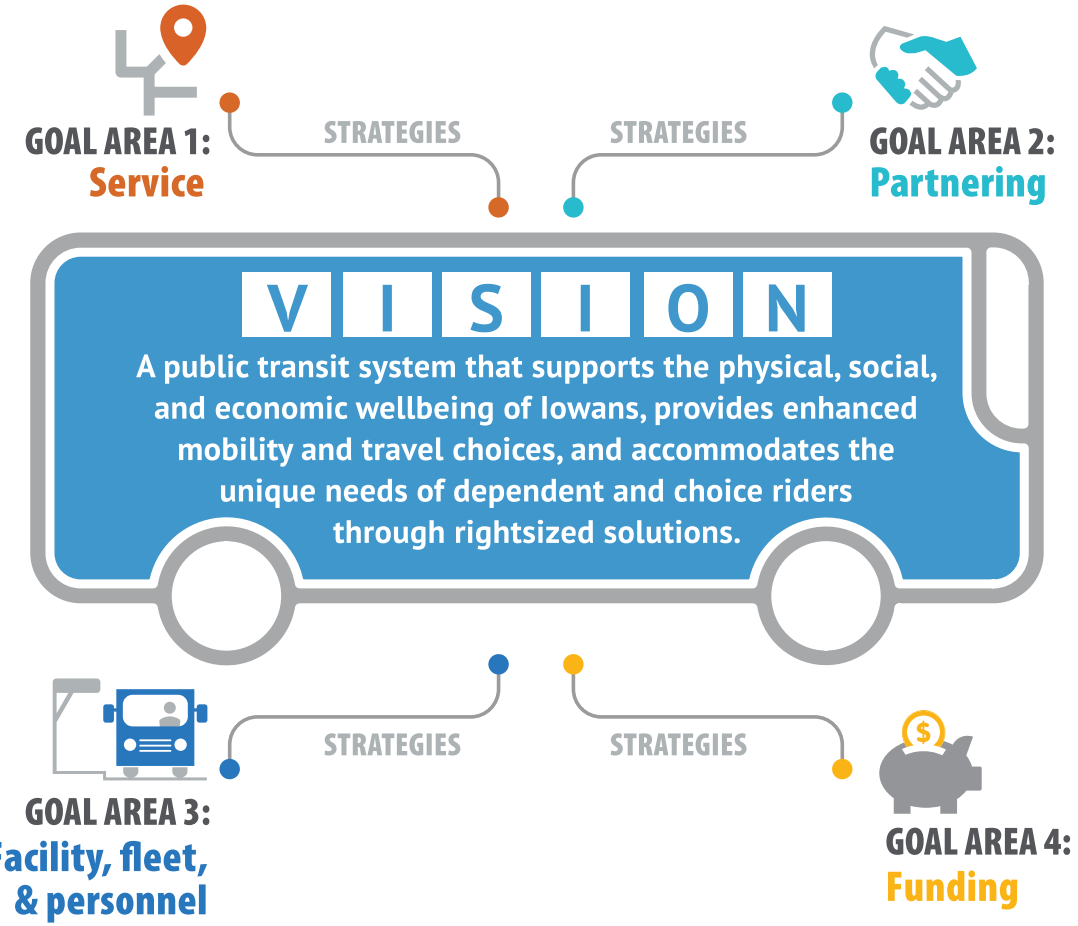
Iowa's Transit Vision

To help translate the overall vision into meaningful actions, an overall structure has been set up with a broad system **vision statement** that captures the overall vision for Iowa's future public transit system, **overarching goal areas**, and **strategies** that have been identified to help achieve the system vision. The vision statement for public transit in Iowa is:

"A public transit system that supports the physical, social, and economic wellbeing of Iowans, provides enhanced mobility and travel choices, and accommodates the unique needs of dependent and choice riders through rightsized solutions."

The intent of the vision statement is to steer the overall efforts of the Plan toward a meaningful end goal; in particular, to enhance mobility overall, improve the ability to get from point 'A' to point 'B', and tailor service options to an area's needs. As the statement indicates, this plan is for all types of transit riders, whether they are dependent upon public transit and have limited transportation options, or they choose to ride public transit to take advantage of one or more of its benefits.

One aspect of public transit that is oftentimes understated, misunderstood, or unrealized is the physical, social, and economic benefit that public transit offers to community wellbeing. Public transit allows riders who are completely unable to transport themselves to access vital public services, businesses, and activities that they otherwise could not access. Enabling all residents of Iowa to remain mobile regardless of age, income, or impairment allows them to stay healthier, more productive, and able to enjoy the amenities that Iowa has to offer. Public transit can also enhance productivity of employees and businesses by connecting workers and employers.



Collectively, the wide range of public transit benefits and beneficiaries will be realized through strategies that prioritize rightsizing solutions. What this means is that everything from the transit fleet to its services should be tailored and optimized to support the unique needs of each area in order to operate as safely and efficiently as possible. In other words, transit systems will be better positioned to use "the right tool for the right job." To help organize these strategies and rightsizing solutions, they are categorized under four general goal areas: Service; Partnering; Facility, Fleet, and Personnel; and Funding.

Iowa's Transit Strategies

As described above, strategies were categorized into goal areas that serve the purpose of helping focus the implementation of the Plan. The following sections describe each goal area and the strategies identified within it.

Goal Area 1: Service

The public transportation system is spread out across all of Iowa and offers a variety of types of transit service. This includes metropolitan areas that have fixed route service with bus stops, regional on-demand service that is scheduled ahead of time, and paratransit that accommodates users with disabilities. The service strategies involve actions that could enhance, expand, or otherwise augment transit service in Iowa.

Service strategies

- Examine the effects of offering fare-free statewide bus service.
- Examine bus service hours for people who work nights and weekends.
- Prioritize funding applications for communities that improve transit service or access.
- Examine the effects of creating more urban transit services in areas that are currently covered by regional transit services.
- Continue existing services and establish new inter-regional services along commuter routes (such as Interstate 380 between Cedar Rapids and Iowa City, Interstate 35 between Ames and Des Moines, and Interstate 74 between Davenport and Illinois).
- Start a subscription price service that works across all bus services in Iowa and includes bikes, scooter sharing, and parking facilities.
- Enable all buses and transit agencies in the state to accept digital fares or electronic payment formats, while still allowing for cash payments.
- Improve accessibility of all transit information, service notifications, and bus route information to ensure they are easy to understand for older adults, multilingual riders, and riders with audio, visual, or cognitive impairments.
- Establish standardized data collection and reporting requirements to better understand ridership.
- Study how to most effectively implement intercity transit bus systems in Iowa.
- Study and define a statewide minimum level of essential transit service necessary to meet critical needs, particularly in the event of severe and sustained disruptions to demand or service.

Goal Area 2: Partnering

By establishing partnerships with other public and private entities, a more diverse array of resources can be leveraged across a much wider area. Partnerships enable organizations to offer a much larger selection of services that would otherwise not be available. The partnership strategies involve multiple entities working together to enhance transit options.

Partnering strategies

- Improve bus transfers between regions and counties in order to support longer and more efficient trips across the state.
- Partner with companies (such as taxis, Uber, Lyft) in order to support city bus routes and provide more transportation options.
- Improve workforce development by partnering with businesses to help employees get to work.
- Partner with non-profit organizations (such as American Cancer Society, Veteran's Affairs, and hospitals) to help people get to their medical appointments on time.
- Partner with other government organizations to increase the number of transportation options for traveling long distances.
- Work with businesses to create transportation options for their employees by offering subsides, bus passes, or incentives such as tax breaks.
- Improve sidewalks and connecting infrastructure by working with state agencies, local government, and private organizations to improve access to bus stops and transit services.

Goal Area 3: Facility, Fleet, and Personnel

When it comes to capital improvements and addressing personnel needs, many times the strategies reflect the kinds of investments that are not easily seen by the public. These strategies can take the form of facility construction and maintenance activities, which do not directly impact transit service, but indirectly influence a transit agency's ability to effectively administer it. Some direct impacts of capital improvements can be seen in the age or condition of buses. As capital assets such as the bus fleet increase in age, their maintenance costs increase, which can negatively impact services. The facility, fleet, and personnel-related strategies would help make sound investments for the agencies that operate public transit.

Facility, fleet, and personnel strategies

- Develop a rightsizing strategy for transit agency bus fleets to decrease costs and better match vehicle sizes to the number of people taking the bus.
- Decrease fuel costs for transit agencies by adopting electric, hybrid, or flex-fuel efficient vehicles.
- Prioritize transit facilities that are evaluated as being in marginal or poor condition for reconstruction or repair.
- Save costs by encouraging transit agencies and local governments to share facilities and staff.
- Address the bus driver shortage by targeting non-traditional candidates to expand the pool of potential applicants.
- Increase training for bus drivers to better serve mobility, hearing or visually impaired riders, children, older adults, immigrant, and refugee populations.
- Identify minimum technology needs for all transit agencies and develop a technology implementation plan.
- Update the Park and Ride System Plan to determine ideal locations for carpooling and ridesharing to support commuting activities.
- Improve the coordination of transportation services between transit agencies and other transportation providers by promoting and hiring mobility manager positions to provide statewide coverage.

Goal Area 4: Funding

The costs associated with nearly all aspects of public transit, particularly capital assets and operations, typically increase over time due to factors such as inflation. Compounding this issue is the fact that traditional funding to offset these costs comes from revenue streams that have remained relatively stagnant over time. Agencies are faced with dilemmas such as cutting staff or services in order to replace or maintain aging buses, or reducing the number of active buses in operation, which reduces the number of routes or their frequency. The funding strategies are aimed at improving transit operators' choices for effectively serving the public.

Funding strategies

- Decrease maintenance costs by focusing resources on replacing transit vehicles that are beyond their useful life.
- Examine alternative ways of funding public transit that do not rely only on existing federal and state sources.
- Conduct a benefit-cost analysis or economic impact study of transit services and projects in order to measure the impact and overall benefit to social welfare.

Prioritization of Iowa's Transit Solutions

Feedback through the public survey in October 2019 allowed members of the public to provide input regarding the relative importance of strategies. Following that effort, the stakeholder groups guiding the development of this Plan also provided feedback, which largely mirrored the trends from the public. This also provided further validation that the strategies were sufficient to address the short-term and long-term objectives of this Plan. Strategy prioritization and resourcing is addressed in Chapter 5, which discusses the implementation of the strategies.