SMART COLUMBUS

Prenatal Trip Assistance (PTA) Concept of Operations

for the Smart Columbus Demonstration Program

FINAL REPORT | September 11, 2018

Produced by City of Columbus

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Acknowledgement of Support

This material is based upon work supported by the U.S. Department of Transportation under Agreement No. DTFH6116H00013.

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Chapter 1. Introduction

This Concept of Operations (ConOps) serves as a high-level view of the Prenatal Trip Assistance (PTA) Project for the Smart Columbus program. The purpose of this ConOps is to clearly convey an elevated view of the system to be implemented from the viewpoint of each stakeholder.

PTA will implement a web and smartphone-based software application to facilitate Non-Emergency Medical Transportation (NEMT) trips for expectant mothers enrolled in Medicaid from designated high-risk neighborhoods. These trips will connect the pregnant women with prenatal and post-partum care appointments and accommodate additional needed stops/trips during the pilot as requested (other medical appointments, pharmacy, etc.).

This document frames the overall PTA system, sets the technical course for the project, and serves as a bridge between early project motivations and the technical requirements. The ConOps is technology independent, focuses on the functionality of the proposed system, and forms the basis of the project. The ConOps also serves to communicate the users' needs and expectations for the proposed system. Finally, this document gives stakeholders the opportunity to provide input as to what the proposed system should do, which will help build consensus and create a single vision for the system moving forward.

1.1. DOCUMENT OVERVIEW

The structure of this document is tailored from the Institute of Electrical and Electronics Engineers (IEEE) Standard 1362-1998 containing the following sections:

- **Chapter 1. Introduction** provides a high-level overview of the general concepts and nature of the PTA project.
- **Chapter 2. References** identifies all documents referenced and interviews conducted in developing this document.
- **Chapter 3. Current System** describes the current and supporting systems and problem(s) to be addressed.
- **Chapter 4. Justification and Nature of Changes** describes the features that motivate the project's development.
- **Chapter 5. Concept for the New System** provides a high-level description of the proposed system resulting from the features described in **Chapter 4**.
- **Chapter 6. Operational Scenarios** presents how the project is envisioned to operate from various perspectives.
- **Chapter 7. Summary of Impacts** describes the impacts the project will have on the stakeholders, users, and system owners/operators.
- **Chapter 8. Analysis of Prenatal Trip Assistance** provides an analysis of the impacts presented in **Chapter 7**.
- **Chapter 9. Notes** includes additional information to aid in the understanding of this ConOps.

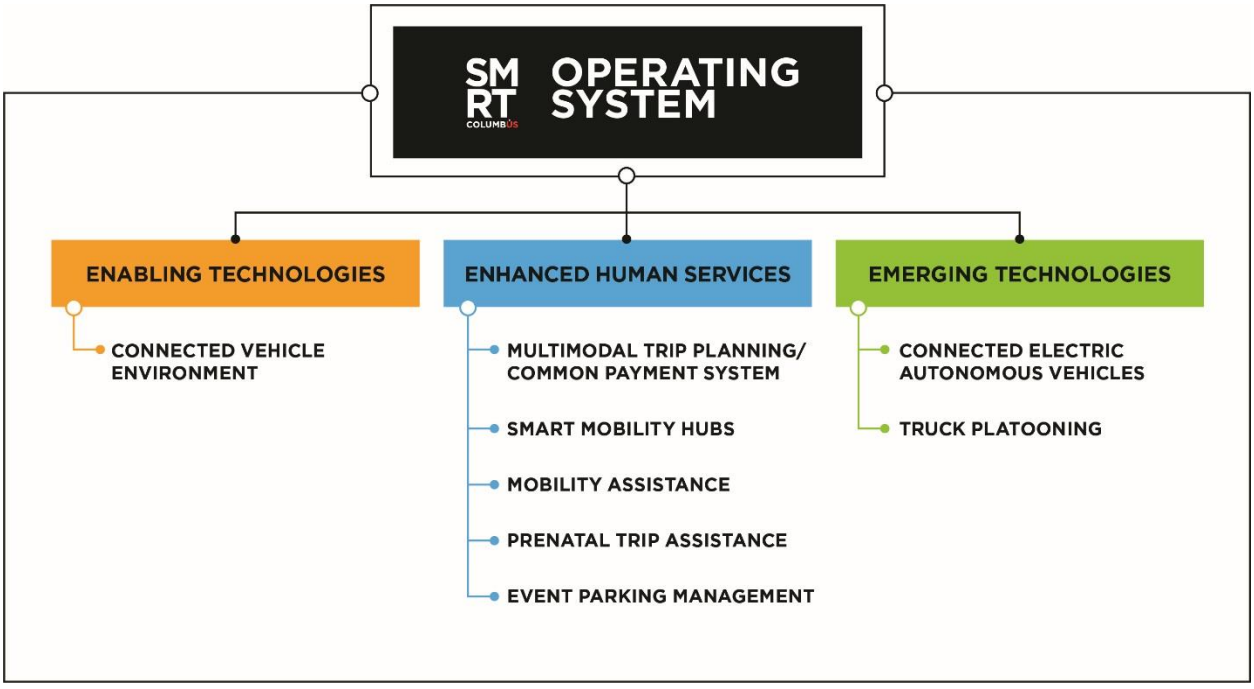
1.2. PROJECT SCOPE

In 2016, the U.S. Department of Transportation (USDOT) awarded $40 million to the City of Columbus, Ohio, as the winner of the Smart City Challenge. With this funding, Columbus intends to address the most pressing community-centric transportation problems by integrating an ecosystem of advanced and innovative technologies, applications, and services to bridge the sociotechnical gap and meet the needs of residents of all ages and abilities. In conjunction with the Smart City Challenge, Columbus was also awarded a $10 million grant from Paul G. Allen Philanthropies to accelerate the transition to an electrified, low-emissions transportation system.

With the award, the City established a strategic Smart Columbus program with the following vision and mission:

- **Smart Columbus Vision**: Empower residents to live their best lives through responsive, innovative, and safe mobility solutions.
- **Smart Columbus Mission**: Demonstrate how Intelligent Transportation Systems (ITS) and equitable access to transportation can have positive impacts on every day challenges faced by cities.

To enable these new capabilities, the Smart Columbus program is organized into three focus areas addressing unique user needs; enabling technologies, emerging technologies and enhanced human services. This portfolio of technical concepts was divided into nine individual projects shown in **Figure 1: Smart Columbus Projects**. The PTA primarily addresses needs in the enhanced human services program focus area.



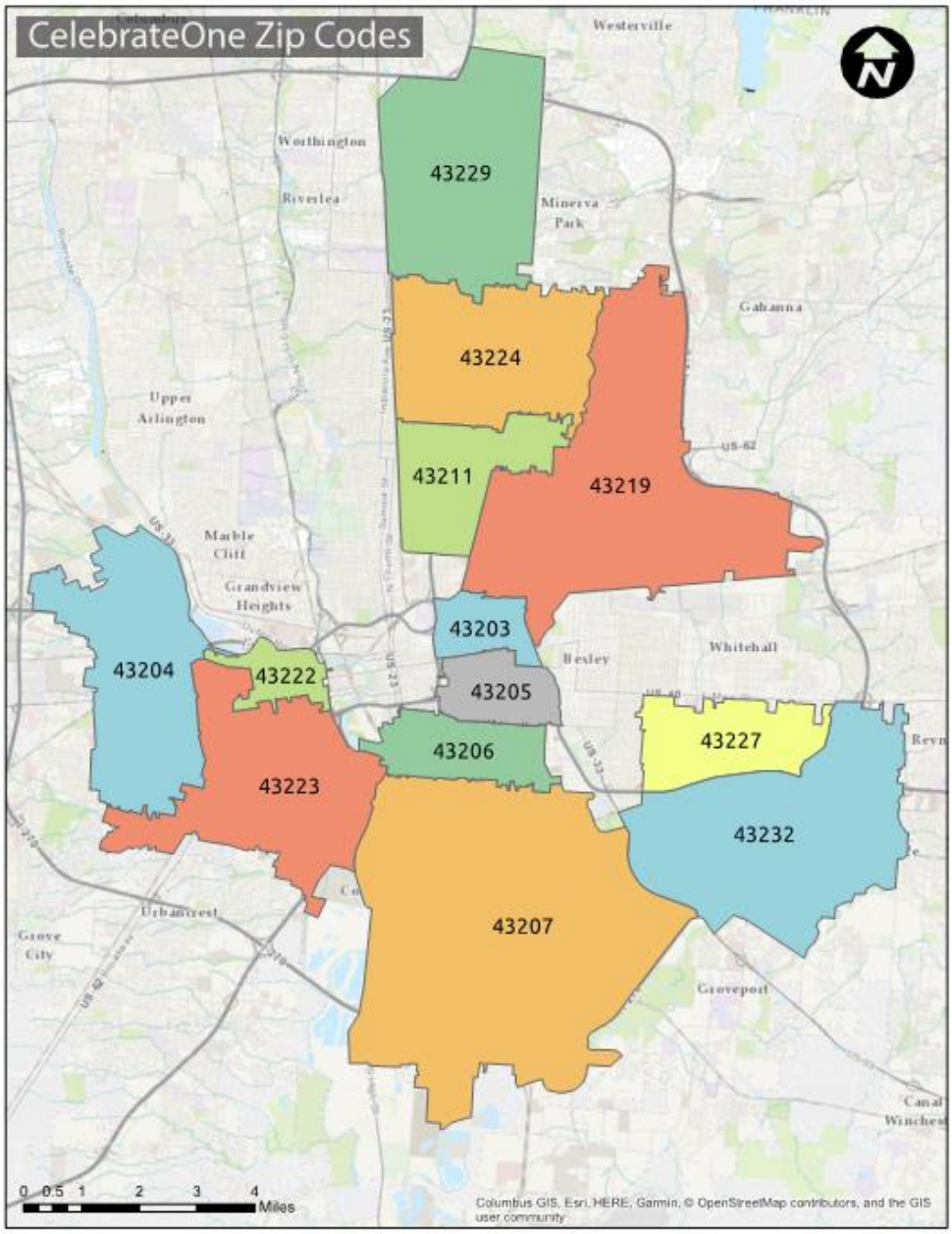
Source: City of Columbus

Figure 1: Smart Columbus Projects

Infant mortality is defined as the number of children who die before their first birthday. The rate is shared as the number of deaths per 1,000 live births. Franklin County, Ohio, home of the state's capital of Columbus, has one of the highest rates of infant mortality in the United States at 8.2 per 1,000 live births. Further, there is a pronounced racial disparity in infant mortality in the county with non-Hispanic black infants almost three times more likely to die than non-Hispanic white infants (14.8 versus 4.9 per 1,000, 2017). In response to this public health crisis, in 2014, the City of Columbus and Franklin County convened an infant mortality task force that developed recommendations and formed CelebrateOne, a dedicated office in the City of Columbus, to carry out the community's plan.

CelebrateOne is a division of the Mayor's Office that works to reduce infant mortality in the City of Columbus. In analyzing patterns of infant deaths in the county, CelebrateOne found that the majority of deaths were occurring in eight "hot spots" throughout the community with all of the hot spots being impoverished neighborhoods. More than half of infant deaths were related to prematurity, with birth defects, and sleep-related deaths being the other most frequently identified causes. These eight neighborhoods with a history of high infant mortality have become CelebrateOne's program focus. To be consistent with their program and to utilize their existing relationships, the PTA deployment will occur in those eight neighborhoods that are shown in **Figure 2: CelebrateOne Neighborhoods**. The neighborhoods and their respective zip codes follow.

- Near South (43206, 43207)
- Linden (43211)
- Near East (43203, 43205)
- Hilltop (43204)
- Franklinton (43222, 43223)
- Morse/161 (43224, 43229)
- Southeast (43227, 43232)
- Northeast (43219)

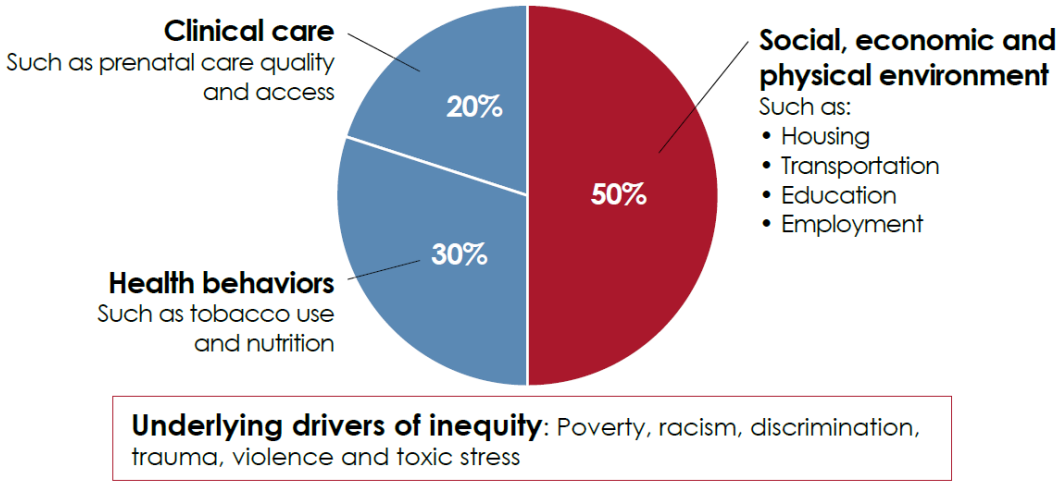


Source: City of Columbus

Figure 2: CelebrateOne Neighborhoods

Receipt of early and adequate prenatal care is essential for preventing the two main causes of infant mortality, preterm birth (<37 weeks of gestation), and congenital anomalies. “Prenatal” is defined as the time during which a woman is pregnant. Prenatal care is extremely important for an expectant woman, from receiving general information about pregnancy to early identification of health concerns. Every pregnancy is different; therefore, prenatal care is needed for each pregnancy. General medical care is also extremely important to a healthy pregnancy. Dental and regular doctor visits are musts during pregnancy. The overall

health of the mother plays a significant role in the birth outcome. Other factors affecting birth outcome are employment, education, living arrangement and complications from other births. Transportation is a piece of a complete puzzle that can help lower the rates of infant mortality. **Figure 3: Modifiable Factors of Health** shows the number of factors that can influence prenatal health.



Source: Health Policy Institute of Ohio, December 2017

Figure 3: Modifiable Factors of Health

Safe and reliable transportation to prenatal care appointments remains a constant challenge for women living in poverty in our community. Bus passes are often outside women's budgets and the bus stops are not always conveniently located to women's homes and/or prenatal care providers. Most women living in poverty in Greater Columbus have their medical care paid for by a Medicaid Managed Care Plan offered by a Managed Care Organization (MCO). While these plans do provide transportation to and from medical appointments during pregnancy, services may present challenges and cause women to use another option. Further, while all MCOs serving the local community provide non-emergency medical transportation (NEMT) in some form, many do not cover other important health-related trips like trips to the pharmacy, food bank or grocery store.

Stress during pregnancy can lead to adverse effects including pre-term birth and even infant mortality. This is especially true for pregnant women who experience chronic and/or additional stress. For those women, easy-to-schedule, safe, reliable transportation to prenatal medical appointments can make a difference in their own health and that of their unborn baby. The Centers for Disease Control and Prevention's National Center for Health Statistics reviewed 2013-2015 data from each state and found the following infant mortality rates: In Ohio, the infant mortality rate was 7.13 deaths per 1,000 live births; nationally, the rate was 5.9 deaths per 1,000 live births[1]; and in Franklin County, the rate was 7.7 deaths per 1,000 live births in 2015[2]. From October 1, 2016, to September 30, 2017, the infant mortality rate in Franklin County was 8.6

[1] *Centers for Disease Control and Prevention's National Center for Health Statistics, 2013-2015 Data, NCHS Data Brief No. 295, January 2018*

[2] *Columbus Public Health VitalView (2015)*

deaths per 1,000 live births[3]. These statistics have drawn the attention of the City of Columbus leadership and they are focused on making changes that are necessary to impact this issue. During the Smart City Challenge pursuit writing, Columbus leadership wanted to include a project that focuses on their most vulnerable population resulting in a project opportunity around infant mortality and transportation.

There have been many advances in "smart" applications in transportation over the past 10 years. However, despite the fact that the vast majority of impoverished women have a mobile phone, with many having a smartphone (albeit with limited data plans), the transportation providers (predominantly taxis) currently used by the MCOs are very low tech with no mobile alerts or two-way communication with the women. The purpose of the proposed study is to examine the efficacy of providing expanded and "smart" transportation services to increase customer satisfaction and reduce adverse pregnancy outcomes among women whose children are at high risk of infant mortality.

The goal of the Smart Columbus PTA project is to focus on one of the factors that can impact pre-term birth: transportation. The PTA project will enhance mobility and increase opportunity, efficiency and customer service for Prenatal Travelers who use NEMT provided through Medicaid benefits. PTA will provide sources of high-quality data for the Ohio Department of Medicaid (ODM), MCOs and others involved in tracking the prenatal care of Columbus Medicaid recipients.

Many NEMT services exist but the lack of patient-centered technology and service has created gaps for certain prenatal travelers. The improvements that would fill these gaps for prenatal travelers through the PTA project include:

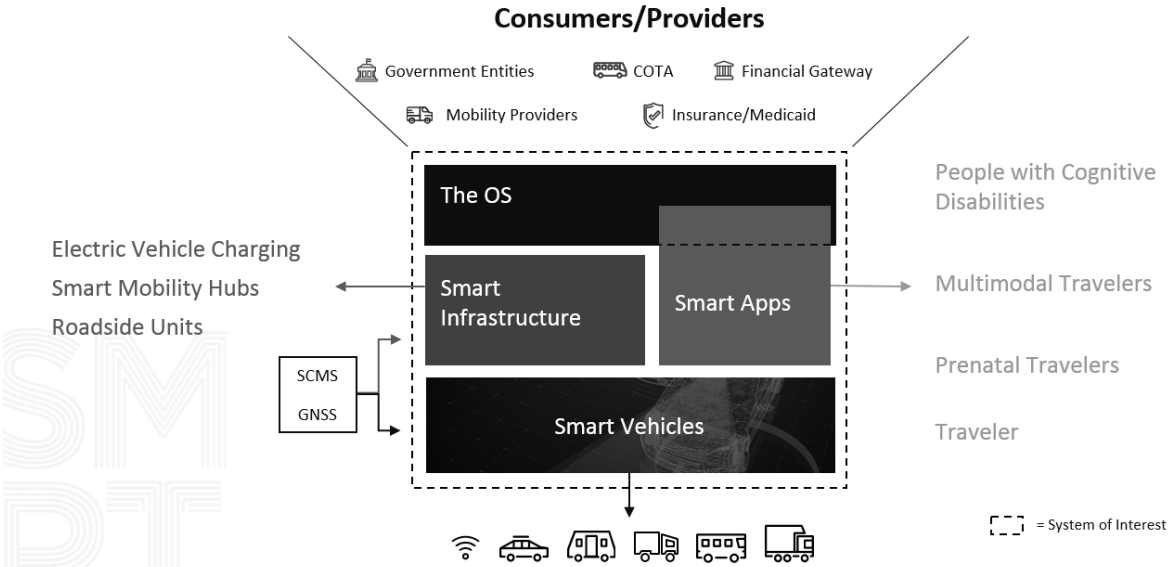
- Reliable transportation to and from medical appointments.
- Access to on-demand transportation.
- Knowledge of real-time driver location and arrival time.
- Enhanced capabilities for patients to schedule NEMT trips.
- Increase communications between NEMT mobility provider, patient and doctor.

1.3. PROJECT RELATIONSHIP TO THE SYSTEM OF SYSTEMS

The Smart Columbus program has many interrelated systems that work together to provide a System of Systems (SoS). Information from these systems are shared in the Smart Columbus Operating System (Operating System). Both real-time and archived data is maintained in the Operating System for use by other Smart Columbus projects and future applications. The SoS provides Smart Applications (Apps), Smart Vehicles, and Smart infrastructure to travelers in the Columbus area. The Operating System enables the SoS to share data with many other internal and external systems to provide the framework for the services provided. Smart Infrastructure includes the hardware and corresponding network that enable interactions between the infrastructure and the Operating System. Smart Vehicles include the connected vehicle equipment that will be installed in vehicles. Smart Applications – of which PTA is one - include the software-oriented solutions that will deliver other Smart Columbus project capabilities such as multimodal trip planning, common payment, prenatal trip assistance, etc. The Operating System is the repository for all performance data from the Smart Infrastructure and Smart Vehicles, as well as the microservices platform that allow the Smart Applications to be directly integrated.

[3] https://www.odh.ohio.gov/-/media/ODH/ASSETS/Files/cfhs/OEI/Quarterly-Scorecard/201709/Appendix-A-Ohio-Regional-Scorecards-and-Definitions-201709.pdf?la=en

Figure 4: System of Systems External Interfaces Context Diagram shows the relationship of the SoS with the external travelers and systems.



GNSS: Global Navigation Satellite System,
SCMS: Security Credential Management System,
COTA: Central Ohio Transit Agency

Source: City of Columbus

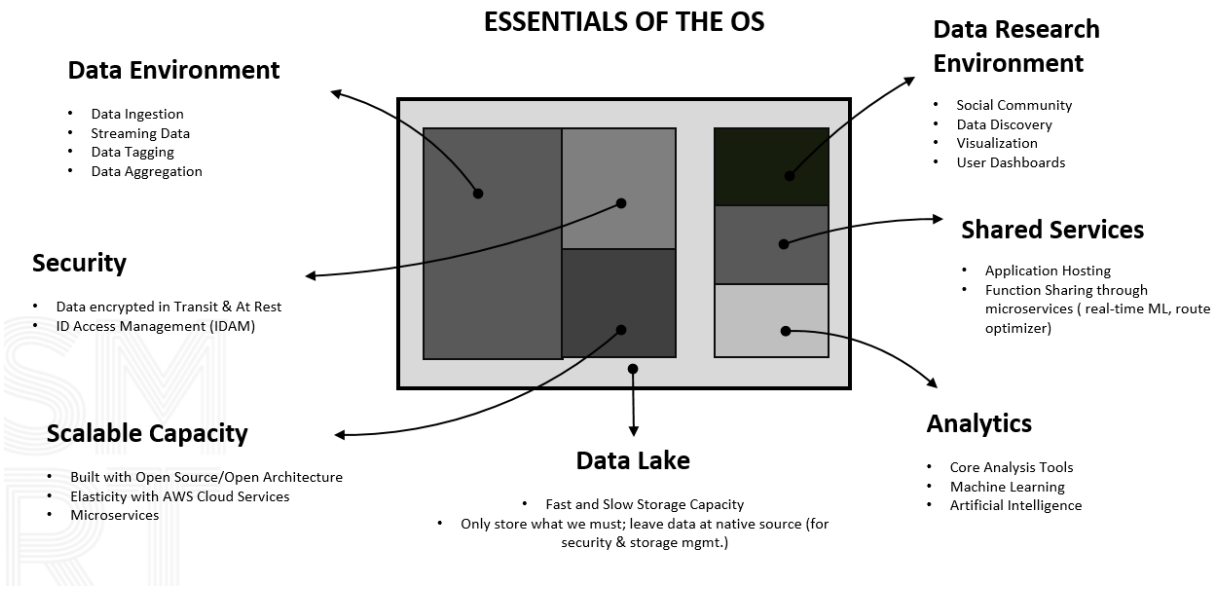
Figure 4: System of Systems External Interfaces Context Diagram

The PTA is one of several Smart Apps in the Smart Columbus SoS. Its purpose is to provide transportation services to pregnant women (Prenatal Travelers), and it will accomplish this leveraging a blend of resources including a Smart App, web interface, application programming interface (API) to the Operating System, call center and data from external providers such as MCOs and transportation brokers (TBs). PTA will take in requests to schedule NEMT trips through an application, web portal and a call center. The application will verify Medicaid and plan eligibility and schedule the trip. The TB and NEMT mobility provider will process reservation information to render services.

1.3.1. Elements of the Operating System

As we described in the previous section, the Operating System is an especially important element of the Smart Columbus smart application solutions including PTA. Given its criticality and impact to these applications and their demonstration, this section provides additional detail about the functionality of the Operating System.

Figure 5: Elements of the Smart Columbus Operating System depicts high-level system elements of the Operating System. Shared Services and Analytics are key components of the PTA system as explained in **Chapter 5. Concept for the New System**.



Source: City of Columbus

Figure 5: Elements of the Smart Columbus Operating System

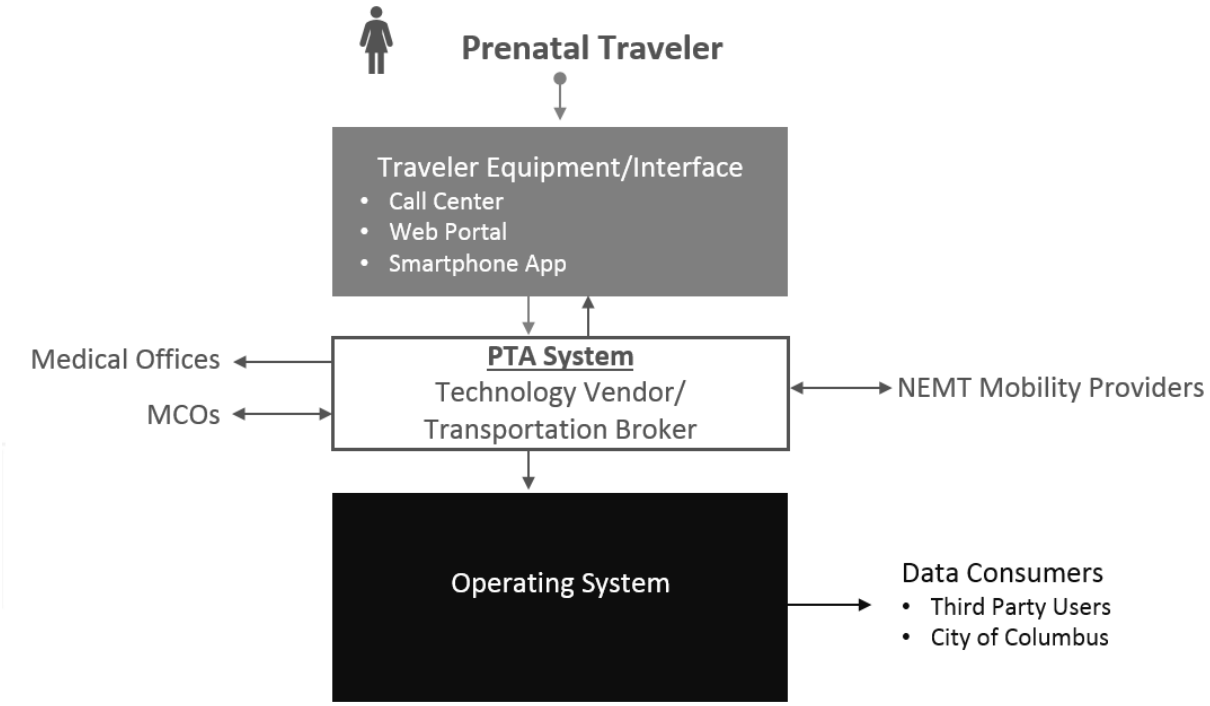
The Operating System is a platform for Smart Cities development. It consists of several core functions, which can be leveraged across the Smart Columbus program, as well as other functions that will specifically enhance and support "Smart Applications" such as the PTA system (**Figure 4: System of Systems External Interfaces Context Diagram**). The core functions in the Operating System are described below:

- **Data Environment**: The orderly ingestion, aggregation and tagging of many forms of data from real-time to slow-moving or manually-uploaded data.
- **Data Lake**: A storage repository that holds a massive amount of raw data in a secure way and makes it available to all the other supported operations in the system.
- **Security**: To ensure trust, it is imperative that the Operating System is exceptional at managing the users and systems that have access to it.
- **Scalable Capacity**: The Operating System is "scalable" and "elastic" which means that it can grow and shrink to meet the demand of the system at any given time.
- **Shared Services Environment**: Application components can be housed and made available to any number of applications connected to the Operating System.
- **Data Research Environment**: In a data-rich environment, Columbus and its residents, businesses, nonprofits and visitors will be increasingly able to share, use and leverage previously unavailable datasets to address complex problems and improve current operations and capabilities. Analytics: Analytics will also be used to predict future conditions and the potential benefits of implementing different operational strategies, control plans and response plans coordinated among agencies and Mobility Providers.

The PTA project interface to the Operating System will be discussed in more detail in **Chapter 5. Concept for the New System**.

1.4. PRENATAL TRIP ASSISTANCE SYSTEM OVERVIEW

Figure 6: High-Level Context Diagram shows the relationship of the PTA to the Operating System and to external parties. The PTA system provides the main user experience and interface for Prenatal Travelers, MCOs, Medical Offices and NEMT Mobility Providers. It also connects to the Operating System to store current and historical information pertaining to individual trips, such as origin and destination. Users at the City of Columbus and third-party users will be able to connect to the Operating System to view and analyze PTA data and other performance metrics on system utilization via reports and custom dashboards.



Source: City of Columbus

Figure 6: High-Level Context Diagram

The descriptions below are a high-level overview of the system and users. Additional information on each of the system components and users is available in **Chapter 3. Current System** and **Chapter 5. Concept for the New System**.

1.4.1. Prenatal Traveler

Prenatal Travelers are end users of the PTA platform who live in the defined service area (see **Chapter 1. Introduction**) and schedule NEMT trips. Prenatal Travelers will use the PTA to schedule NEMT services by creating a trip request by entering information about their trip, such as origin and destination address, as well as personal preferences/needs such as a guest traveler.

1.4.2. Prenatal Trip Assistance System

The PTA system will be an account-based system for managing user accounts and arranging transportation for Medicaid MCO members who use NEMT services. For this project, these members will be known as Prenatal Travelers and will be further defined by the geographic boundaries of the zip codes related to the eight CelebrateOne neighborhoods (see **Figure 2: CelebrateOne Neighborhoods**). The PTA system will work with MCOs to create accounts for Prenatal Travelers, allowing the Prenatal Traveler to make a request for NEMT services. That request will be shared with the MCO to check on Medicaid benefit status through the ODM Benefits System. The ODM Benefits System sends a daily Medicaid membership update to MCOs to assist in service delivery and to prevent fraud.

The PTA system will be developed by a technology vendor who acts in concert with or acts in the place of a TB. This document will refer to this as the technology vendor/transportation broker for the proposed system. The PTA system will act as the TB by taking the reservation request and right-sizing it with vehicles available through NEMT mobility provider contracts. Trip optimization will also be provided as part of the new system.

The PTA system will have a relationship with the medical offices that participate in the project. The PTA system will send a notification to the doctor's office giving information about the Prenatal Traveler's travel status, which will allow the office to move another patient up in line if the Prenatal Traveler is running late or to reach out to a patient who missed her trip to see if she should be rescheduled.

The PTA system will also send multiple notifications to the Prenatal Traveler to remind the individual of the upcoming transportation reservation. There will be an opportunity for the Prenatal Traveler to cancel or reschedule a trip prior to pickup. This information may also be relayed to the doctor's office, so it can initiate a reminder call to see if the appointment also needs to be cancelled or rescheduled.

1.4.3. Managed Care Organizations

MCOs are contracted by the ODM to provide Medicaid services to Ohio residents who qualify for Medicaid benefits. For this project, the MCOs will assist in the development of the RFP, review bid responses and interview possible vendor candidates. After a successful vendor is chosen, the MCOs will contract with a technology vendor/TB to provide the PTA system. Each MCO will work with the technology vendor/TB to easily shift the pilot participants into a separate database to ensure proper collection of the data around their usage of the pilot NEMT. The MCOs will provide this data and other appropriate data as necessary to support the project.

1.4.4. Smart Columbus Operating System

The Operating System is a cloud-based, dynamic, governed data-delivery platform at the heart of the Smart Columbus system. The Operating System also serves as the source for real-time operational data and archived historical data from a combination of data storage sources for use by the City of Columbus and third-party applications/developers. The Operating System is the data platform at the heart of the Smart Columbus data environment that integrates data and data services from multiple sources, including the planned Smart Columbus projects, traditional transportation data, and data from other community partners. The Operating System embodies open-data and open-source concepts to enable better decision-making and problem solving for all users to support a replicable, extensible, sustainable platform.

Specific to PTA, the Operating System will allow the PTA system to provide trip and usage data for use by the City and third-party users.

The ODM, as the administrative department for Ohio's Medicaid program, is responsible for tracking and adhering to federal and state laws surrounding the delivery of Medicaid services. ODM is headquartered in Columbus and contracts with five MCOs to deliver Medicaid (and NEMT) services. ODM also works with and funds each of Ohio's 88 counties' Medicaid NEMT services.

1.4.5. Non-Emergency Medical Transportation Mobility Providers

NEMT Mobility Providers are transportation services in which vehicles are accessed by Medicaid patients to provide NEMT trips to healthcare and other permitted appointments. NEMT Mobility Providers include public transit, Transportation Network Companies (TNCs) or ridesourcing, taxis, limos, and paratransit. NEMT Mobility Providers will contract with the technology vendor/TB to provide NEMT services. The following are examples of NEMT Mobility Providers and their relationships to the proposed system.

1.4.5.1. TRANSPORTATION NETWORK COMPANIES

TNCs (Lyft or Uber) are ridesourcing companies that utilize smartphone app-based services to connect drivers with riders in exchange for payment. TNCs differ from taxi and limo services in that drivers use their own vehicles (noncommercial) and scheduling is all app-based. TNCs contract with TBs to provide NEMT services.

Relationship to proposed system: TNCs could provide on-demand NEMT services for Prenatal Travelers via contract with the PTA system vendor.

1.4.5.2. CENTRAL OHIO TRANSIT AUTHORITY

COTA is the regional public transit provider for greater Columbus and central Ohio, offering fixed-route bus service. Public transit is a shared passenger-transport service which is available for use by the public. COTA serves 1.2 million residents and provides more than 19 million passenger trips annually. COTA is a mobility provider contracted by TBs to provide NEMT services.

Relationship to proposed system: TBs currently offer COTA bus passes as a NEMT option through the MCOs and will continue to be an option for Medicaid members in need of NEMT. Data, relevant to this project, on the number and location of NEMT trips serviced will be shared by the technology vendor/TB with the City.

1.4.5.3. TAXI/LIMO

TBs contract with taxi and limo services to provide NEMT services to Medicaid MCO members.

Relationship to proposed system: Taxis/limos could provide on-demand NEMT services for Prenatal Travelers via contract with the PTA system vendor.

1.4.6. City of Columbus

The City of Columbus convenes the parties that will be part of the PTA pilot to create the PTA system. The City will be party to contracts with OSU for the pilot study and with the participating MCOs for reimbursement of the MCO contract with the technology vendor/transportation broker. The City is responsible for developing needs and requirements for the system and for deciding the policies and rules necessary to meet the goals and objectives of the overall program. The City has governmental staff with access to performance and usage information through integration with the Operating System. Government staff users will have access to reports and performance measurement data to make informed decisions about future improvements to the system and to support broader transportation policy decisions.

1.4.7. Third-Party Users

Third-party users are members of the public, including researchers and entrepreneurs, who will have limited access to data that is generated by the system for development purposes.

1.4.8. Medical Offices

Medical Offices see Medicaid members for medical care. They currently do not have access to information on a patient's transportation. With PTA, these offices will receive notification(s) when a patient has missed or cancelled a trip or when traffic is going to delay a patient's arrival. This will allow the Medical Office to decide if it wants to reach out to the patient or make the proper adjustments to its schedule.

Chapter 2. References

Table 1: References contains the document number, title, revision and publication date of all documents referenced.

Table 1: References

Document Number	Title	Revision	Publication Date
IEEE 1362-1998	Electrical and Electronics Engineers (IEEE) IEEE Guide for Information Technology System Definition ConOps Document	1998	3/19/1998
USDOT Solicitation No.: DTFH6116RA00002	City of Columbus Smart City Application: Beyond Traffic: The Smart City Challenge Phase 2. "USDOT Application Volume I" www.columbus.gov/smartcolumbus/application/	1	7/29/2016
N/A	Smart Columbus Systems Engineering Management Plan (SEMP) for Smart Columbus Demonstration Program	V0.1	2/2/2017
N/A	Health Policy Ohio: A New Approach to Reduce Infant Mortality and Achieve Equity: Policy Recommendations to Improve Housing, Transportation, Education and Employment	N/A	December 2017
N/A	2016 Ohio Commission on Infant Mortality Committee Report, Recommendations, and Data Inventory http://ouw.org/wp-content/uploads/2016/03/Ohio-Commission-on-Infant-Mortality-Committee-Report-March-2016.pdf	N/A	March 2016
N/A	Ohio Senate Bill 332 https://www.legislature.ohio.gov/legislation/legislation-summary?id=GA131-SB-332	N/A	January 2017
N/A	Sidewalk Labs: Non-Emergency Medical Transport for Linden, Columbus	N/A	9/19/2017
N/A	Ford Greenfield Labs: Columbus Mobility Design Research Report	Final Draft	3/19/2018
N/A	Ohio Administrative Code Medicaid Sections 5160 http://codes.ohio.gov/oac/5160	Multiple	
N/A	Ohio Administrative Code Medicaid Sections 5160:1 http://codes.ohio.gov/oac/5160:1	Multiple	

Document Number	Title	Revision	Publication Date
N/A	Ohio Department of Medicaid Rules, http://www.medicaid.ohio.gov/RESOURCES/Legal-and-Contracts/Rules	N/A	
N/A	Social Security Administration, Title XIX – Grants to States for Medical Assistance Programs https://www.ssa.gov/OP_Home/ssact/title19/1900.htm	Multiple	
N/A	United States Constitution 42 U.S.C. 1396 et seq.	Multiple	
N/A	Health Insurance Portability and Accountability Act of 1996 https://aspe.hhs.gov/report/health-insurance-portability-and-accountability-act-1996	Multiple	8/21/1996
N/A	Ohio Department of Medicaid Managed Care Provider Agreements http://medicaid.ohio.gov/Provider/ManagedCare/ProgramResourceLibrary/CombinedProviderAgreement	Multiple	
N/A	City of Columbus Infant Mortality Task Force Report	N/A	June 2014
FHWA-JPO-17-523	ConOps for the MMTPA/CPS Project for the Smart Columbus Demonstration		5/18/2018

Source: City of Columbus

Table 2: Meetings contains meetings which were relevant to development of the PTA ConOps which are referenced directly or indirectly in the document.

Table 2: Meetings

Meeting Title	Recurring	Date
Molina Healthcare "Meet and Greet" (MCO)	No	12/4/2017
CareSource "Meet and Greet" (MCO)	No	12/5/2017
CareSource Coordination Meeting (MCO)	No	12/20/2017
PTA Weekly Meeting	Yes	2/1/2018 to 6/30/2018
CareSource Coordination Meeting (MCO)	No	2/12/2018
Veyo – Smart Columbus NEMT pilot project (technology vendor/TB)	No	2/13/2018
Kaizen Health NEMT (technology vendor/TB)	No	2/16/2018
Circulation NEMT (technology vendor/TB)	No	2/16/2018

Meeting Title	Recurring	Date
Webinar: Mobile Apps: Considerations for Use in Research Involving Human Subjects	No	2/21/2018
Medicaid Transportation Panel – NEMT	No	2/28/2018
Smart Columbus and Uber coordination (NEMT Mobility Provider)	No	3/2/2018
Yellow Cab and Smart Columbus coordination (NEMT Mobility Provider)	No	3/6/2018
Healthcare Collaborative of Columbus – NEMT Meeting	No	3/8/2018
ODM and Smart Columbus coordination	No	3/20/2018
Circulation Smart Columbus NEMT project (technology vendor/TB)	No	3/21/2018
Kaizen Health NEMT (technology vendor/TB)	No	3/28/2018
Yellow Cab coordination (NEMT Mobility Provider)	No	4/5/2018
Smart Columbus follow-up	No	4/6/2018
NEMT meeting with Franklin County Department of Job and Family Services (FCDJFS)	No	4/10/2018
Smart Columbus NEMT pilot – Care Source (MCO)	No	4/11/2018
United Healthcare – Collaborative Opportunities (MCO)	No	4/13/2018
PrimaryOne Medical Services – Collaborative Opportunities (Medical Office)	No	4/16/2018
Molina/Smart Columbus – Collaborative Opportunities (MCO)	No	4/16/2018
Smart Columbus NEMT pilot – Care Source (MCO)	No	4/25/2018
Smart Columbus coordination with UHC (MCO)	No	5/1/2018
MAS Introduction (technology vendor/TB)	No	5/4/2018
Smart Columbus NEMT Pilot Project Discussion Buckeye Health (MCO)	No	5/4/2018
Smart Columbus NEMT Pilot Project Discussion – OSU Wexner Medical Center Research	No	5/11/2018
UZURV Meeting with City of Columbus (technology vendor/TB)	No	5/14/2018
Smart Columbus PTA MCO Workshop #1	No	6/7/2018
Smart Columbus PTA MCO Workshop #2	No	6/27/2018
OSU Partnership Meeting	No	6/27/2018
Serco Vendor Demonstration	No	7/02/2018
ODM Update Call	No	7/12/2018
SC/OSU/CelebrateOne Strategy Session	No	7/19/2018
ODM Consumer Advocate NEMT Session	No	8/21/2018
ODM NEMT Mobility Provider Session	No	8/21/2018

Meeting Title	Recurring	Date
OhioHealth Women and Infant Care Council	No	8/27/2018

Source: City of Columbus

2.1. STAKEHOLDER ENGAGEMENT SUMMARY

The following is a summary of end user and stakeholder engagement activities to assess community interest in utilizing a mobile app for NEMT trip planning. Additional stakeholder engagement summaries, as well as survey questions and answers, are provided in **Appendix A. Stakeholder Engagement Summary** and **Appendix B. Sidewalk Labs' Non-Emergency Medical Transportation Survey Summary**.

2.1.1. Community Outreach

In June through August of 2017, focus groups and phone interviews were conducted to discover how improved mobility via Smart Columbus could be a strategy to reducing infant mortality rates in Linden, which experiences some of the highest numbers of baby deaths in the nation.

Since lack of access to prenatal services is a contributing factor, this outreach included not only the expectant women and new moms, but also other relevant stakeholders involved. These include the following healthcare and NEMT service providers: The Ohio State University (OSU), Mount Carmel, Kaizen Health, Lyft, Uber, Veyo, ODM, Paramount Advantage, Access 2 Care and CareSource. CelebrateOne, a division of the Mayor's Office that works to reduce infant mortality especially in the Linden neighborhood, also participated.

2.1.1.1. KEY TAKEAWAYS

Convenience and safety were big concerns for pregnant women and heavily influenced transportation choices. For example, buses were seen as impractical because it can take up to two hours to get to a doctor's appointment and women felt it was too hard to take other children with them. Taxis and ridesourcing services were cited as better suited methods because they allow for car seats (if installed by the Prenatal Traveler) and provide direct routing to a destination.

Additional takeaways:

- Smartphones and data plans are prevalent in this community.
- Accommodations for strollers, car seats, wheelchairs and walkers need to be made.
- Driver issues include: poor customer service, honking once and leaving, and not stopping to have prescriptions filled on the way home from an appointment which requires the scheduling of yet another trip.
- The use of English only presents a language barrier for some.
- Any pilot project will need to have a thorough educational component for successful adoption.
- Healthcare providers cited a 30-50 percent patient no-show rate, half of which may be transport related. They also said a patient's address can change frequently which results in bookings becoming outdated.

2.1.2. Stakeholder Outreach

Due to the "multiple opportunities for system failure"[4], it was important for initial outreach activities to focus efforts on conversations with NEMT and healthcare providers to get the clearest picture possible of the current situation and develop a pilot that better accommodates pregnant women's needs and expectations. Outreach primarily sought to: 1) understand how providers operate 2) become aware of the laws governing their abilities to provide patient services and 3) investigate frequent disconnects between each of the parties involved in Medicaid NEMT services. Examples of disconnects include NEMT drivers not allowing women to stop at a pharmacy on the way home from an appointment while the MCO's preference is for pharmacy trips to be performed after a medical visit rather than incurring the cost of scheduling another trip.

This engagement took place from February through May of 2018 and included the following NEMT stakeholders:

- Physicians' offices caring for expecting moms – Primary One, OSU, Mount Carmel
- MCOs – CareSource, Buckeye Community Health Plan, Molina Healthcare of Ohio, Inc., United HealthCare Community Plan of Ohio, Inc. and Paramount Advantage
- NEMT providers – Taxi companies and brokers including Hands-On Central Ohio, Step One (part of CelebrateOne), Veyo, Circulation, Kaizen Health, Lyft, Uber and Access 2 Care
- County/state agencies – FCDJFS, ODM, Ohio Department of Transportation (ODOT) and Mid-Ohio Regional Planning Commission (MORPC)
- COTA
- Social support groups – CelebrateOne

2.1.2.1. KEY TAKEAWAYS

More patients are requesting on-demand rides now than ever before. In addition, NEMT providers need automatic patient health insurance eligibility verification to improve their efficiency. Better patient communications overall are needed. Additionally, ODOT is in the process of developing new regulations for human services transportation because Ohio's current brokerage system needs to be improved.

2.1.3. Additional Relevant Community Outreach

Knowledge gleaned from previous outreach initiatives (conducted prior to the conception of the PTA project) is also being used to craft the PTA pilot. This includes information uncovered during the two-day community dialogue, branded the "Smart Columbus Connects Linden" community planning event held February 10 and 11, 2017, at St. Stephen's Community House, 1500 E. 17th Ave., Columbus. More than 170 Linden community residents shared their views and ideas regarding what will make Linden a "smart" community including several valuable linkages such as the fact that most attendees favored a smartphone app to make travel arrangements – seeing it as a convenient option – and most attendees had privacy concerns with personal information being provided electronically.

[4] *Sidewalk Labs*

Information gathered during the two-day Connect Linden discussions, as well as discussions with Linden leaders, community surveys, and other feedback, is included in **Appendix A. Stakeholder Engagement Summary**.

2.1.4. Field Surveys

Key takeaways from field surveys issued to stakeholders in the Columbus area in 2018 to inform the MMTPA/CPS projects will again serve double-duty in that they will also be used to inform the PTA project.

There were about 100 respondents to the surveys, which are included in **Appendix A. Stakeholder Engagement Summary** and summarized as follows:

- Over 90 percent of respondents stated that they had a cell phone. Of those, over 90 percent said that their cell phone was a smartphone. Most people with smartphones – 87 percent – also have a data plan.
- Text messages are the most popular choice for receiving notifications from an app.
- The most popular features that respondents would like to see in an app (in order of preference) are: 1) Plan/select multiple types of travel, and 2) Find the quickest way to get somewhere.

Chapter 3. Current System

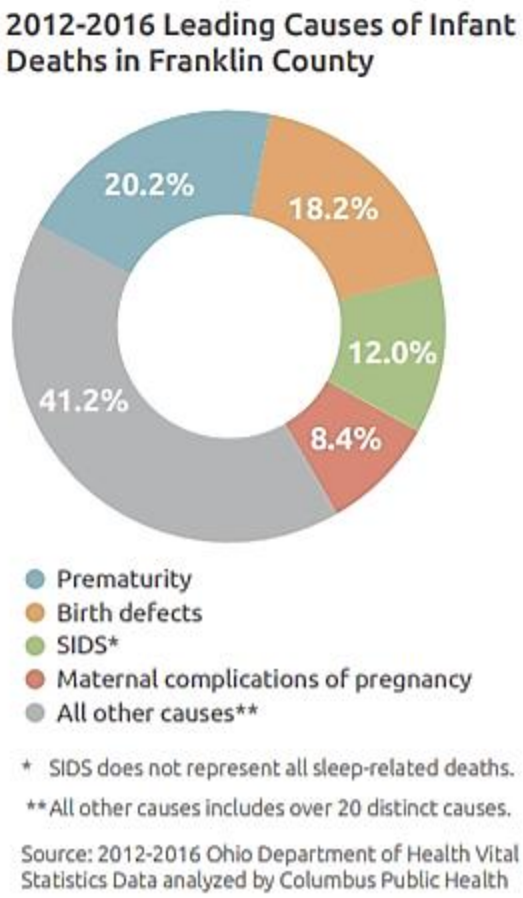
The current system of Medicaid NEMT delivery does not offer reliable transportation to and from medical appointments, customer friendly services like detailed driver information, advanced technology or on-demand services for scheduling NEMT services. Prenatal Travelers, similar to other Ohio Medicaid NEMT users, only have the option to schedule NEMT trips through a call center. On-demand services are considered an emergency and provided on an as available basis. Prenatal Travelers do not get reminded multiple times of their trip and have no portal to access future trip reservations. They also do not know when their driver is about to arrive. With the technology and transportation services that exist in the market, this process can be improved.

3.1. BACKGROUND AND OBJECTIVES

CelebrateOne stated that "Infant mortality is not simply a health care issue. It is a complex, systemic problem influenced by a variety of factors and compounded by a range of social and economic conditions in disadvantaged neighborhoods."[5] This complex problem has been a major focus of the City of Columbus, Franklin County and many community and business partners for the past five years. In 2013, the Greater Columbus Infant Mortality Task Force was formed and released a report and implementation plan in 2014 with eight recommendations to reduce the county's infant mortality rate by 40 percent and to cut the racial health disparity in half by 2020.

As described in **Chapter 1. Introduction**, CelebrateOne is the City of Columbus led initiative created to carry out the Greater Columbus Infant Mortality Task Force's list of recommendations and ensure Franklin County meets its ambitious goal to reduce the infant mortality rate to 6 deaths per 1,000 live births and to cut the racial health disparity in half by 2020. The Task Force learned during its research process that eight Columbus neighborhoods were experiencing a higher than average rate of infant deaths. From 2012-2017 the infant mortality rate for Franklin County was 8.3 deaths per 1,000 live births and during the same time period the infant mortality rate for our eight highest risk neighborhoods was 12 deaths per 1,000 live births. When researching causes of infant mortality, one indicator continued to show the highest impact: pre-term births. **Figure 7: Leading Causes of Infant Deaths in Franklin County** shows that prematurity (birth before 37 weeks) is the largest cause of infant mortality in Franklin County.

[5] *CelebrateOne 2016 Annual Report, http://celebrateone.info/wp-content/uploads/2017/08/2016_annual-report_spread.pdf*



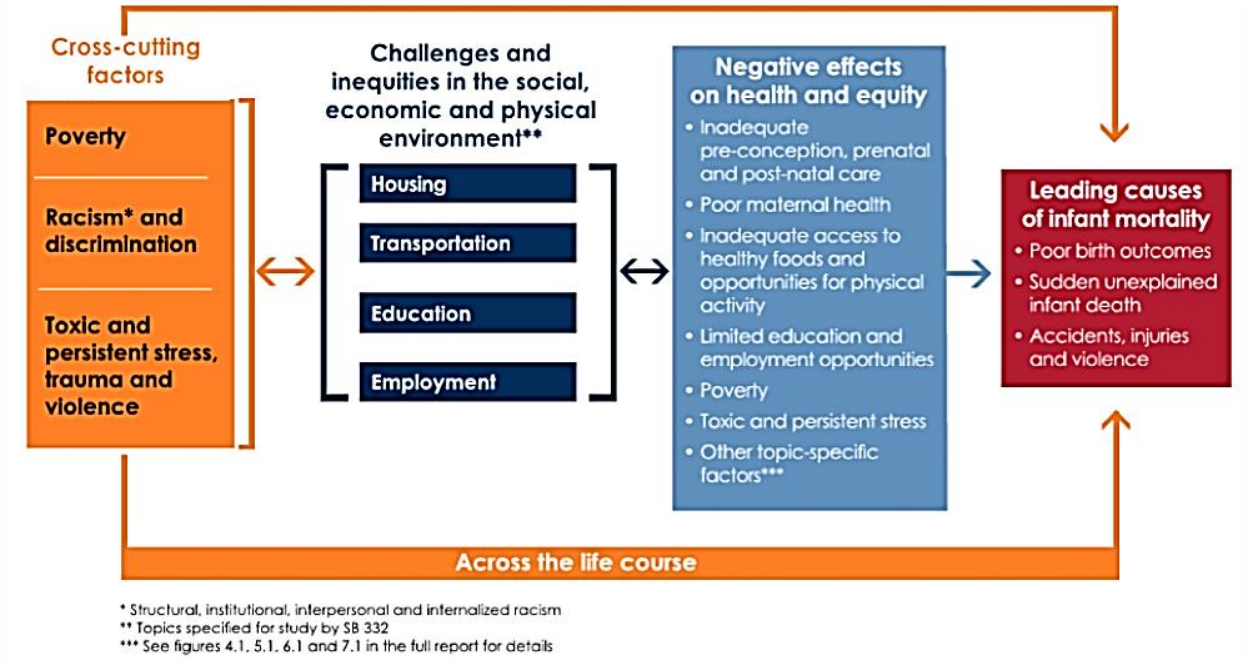
Source: Celebrate One Annual Report 2016

Figure 7: Leading Causes of Infant Deaths in Franklin County

The State of Ohio also took notice of the rising infant mortality rate affecting Ohio. In Senate Bill 322 (2016), legislators called for action against infant mortality. This bill required that a non-profit research this issue and provide recommendations to move Ohio forward in assisting expectant women and their children. The state hired Health Policy Institute of Ohio whose research has also shown pre-term birth to be a leading factor in infant mortality across the state.

Both CelebrateOne and the Health Policy Institute of Ohio agree that there are many factors impacting infant mortality. These factors are often referred to as social determinants of health. Key social determinants of health identified in the Health Policy Institute of Ohio report, *A new approach to reduce infant mortality and achieve equity*, include housing, education, employment and transportation. As this is a USDOT grant, this project will maintain a focus on the transportation issues within pre-term birth, specifically getting expectant women to and from their prenatal appointments.

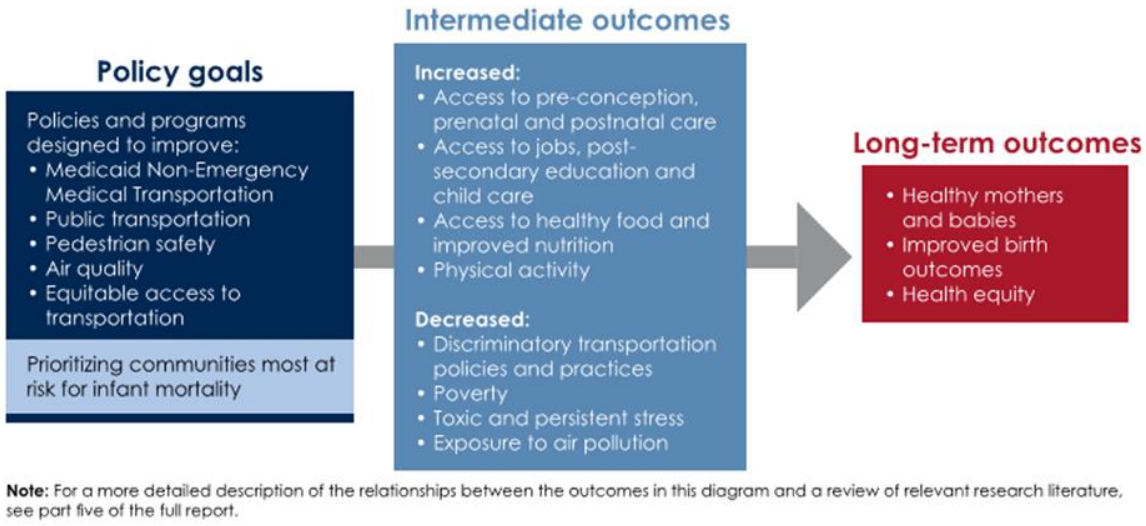
Figure 8: Summary of Relationships Between Social Determinants of Health and Infant Mortality from the Health Policy Institute of Ohio illustrates how social determinants of health challenges and inequities affect infant mortality. Transportation is noted in the second column.



Source: Health Policy Institute of Ohio, December 2017

Figure 8: Summary of Relationships Between Social Determinants of Health and Infant Mortality

When the Health Policy Institute of Ohio focused its research on transportation, it identified the following policy goals, intermediate outcomes and long-term outcomes shown in **Figure 9: Transportation Policy Goals**.



Source: Health Policy Institute of Ohio, December 2017

Figure 9: Transportation Policy Goals

NEMT and prenatal care continue to be on every report and list of recommendations when it comes to tackling infant mortality.

Figure 10: Transportation Policy Goals and Recommendations breaks those policy goals down into next step recommendations which highlight the need for the PTA project.

Transportation policy goals and recommendations

Goal 1	Increase access to health care, particularly for pregnant women and parents of young children, by evaluating and continuously improving Medicaid Non-Emergency Medical Transportation provided through managed care plans
1.1	Medicaid managed care plans can monitor NEMT grievances from members and promptly make changes to improve the timeliness and quality of NEMT, prioritizing infant mortality hot spot areas.
1.2	Medicaid managed care plans can improve the timeliness, responsiveness, and customer service of NEMT provided by vendors (including reduced wait times and improved scheduling process), and increase the overall accountability and transparency of the Medicaid NEMT system.
1.3	Medicaid managed care plans can explore the use of Lyft, Uber or other ride-sharing services and innovative technologies (such as apps) for NEMT.
1.4	The Ohio Department of Medicaid can carefully monitor and enforce managed care plan compliance with NEMT requirements in their contracts.

Goal 2	Increase access to health care, particularly for pregnant women and parents of young children, by evaluating and continuously improving Medicaid Non-Emergency Medical Transportation to be provided through the new state-based brokerage model starting in 2018
2.1	The Department of Medicaid can develop performance metrics and a data tracking system to monitor the effectiveness of the new brokerage model. Metrics to monitor include: a. Passenger information (type of visit, number of passengers, etc., while protecting patient privacy) b. Ride information (on-time rates, no-show rates for drivers and passengers, wait times, etc.) c. Quality of service information (complaints, driver reviews, call volume and responsiveness, etc.) The Department can use this information to monitor performance of vendors, identify trends, increase transparency and accountability, and improve service, particularly in infant mortality hot spot areas.
2.2	The Department of Medicaid can use the results of the performance measurement described above to improve the timeliness, responsiveness, and customer service of NEMT provided by vendors (including reduced wait times and improved scheduling process) and increase the overall accountability and transparency of the Medicaid NEMT system.
2.3	The Department of Medicaid can explore the use of Lyft, Uber or other ride sharing services and innovative technologies (apps) for NEMT.

Source: Health Policy Institute of Ohio, December 2017

Figure 10: Transportation Policy Goals and Recommendations

The ODM has also been focused on this issue. Until May 2018, ODM was moving quickly on creating changes to the county delivered NEMT services. Given the upcoming gubernatorial race and initial push-back from rural counties to a centralized NEMT delivery system, ODM has decided to make this a 2019-2020 issue.

3.2. OPERATIONAL POLICIES AND CONSTRAINTS

Operational policies and constraints in this section (see **Table 3: Operational Policies and Constraints of the Current System**) apply to the current situation. Operational policies are predetermined decisions regarding the operations of each component or sub-component of the current system, typically in the form of general statements or understandings that guide development, design and decision-making activities. Constraints are impediments outside of policy that restrict the current system from achieving its goal with respect to objectives.

Table 3: Operational Policies and Constraints of the Current System

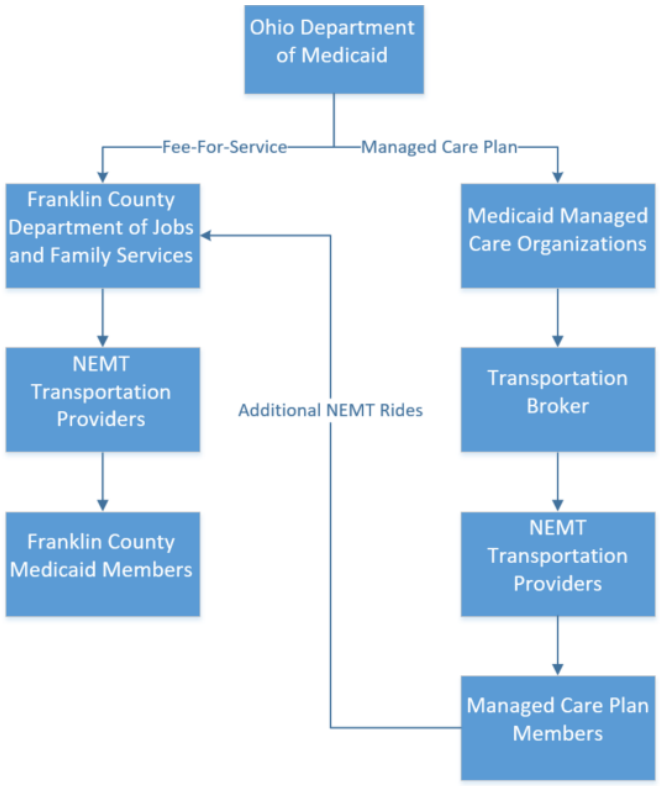
Category	Operational Policies and Constraints
Constraint	Medical offices, MCOs and NEMT Mobility Providers do not have an ability to share information about NEMT trips, i.e. origin and destination, time of arrival, time of departure or a missed trip.
Constraint	Data does not exist in a common format to allow MCOs, ODM or others to make informed decisions on changes to the NEMT services provided to expectant women.
Constraint	Many NEMT Mobility Providers are contracted by multiple entities (TBs, agencies, companies, etc.) to provide NEMT services. Each entity has its own requirements around documentation which can lead to data entry mistakes.
Constraint	It is acknowledged there are existing policies and constraints imposed by Mobility Providers through existing API usage which limit the functionality available to third-party developers. There are Mobility Providers who may not currently share APIs with third-party developers or support open standards and data exchange.
Constraint	There are five MCOs each with their own TB, either in-house or through contract.
Constraint	The City of Columbus does not play a role in the delivery of NEMT services and will need to bring multiple partners, who are competitors in the Medicaid marketplace, on board to work together.
Policy	There are policies at the state (ODM) level and the federal level when it comes to NEMT services that must be followed. These policies, rules and regulations are listed in **Table 1: References**.
Policy	NEMT Mobility Providers have a policy of not providing car seats for riders. They will allow a rider to bring a car seat with her to install but will not assist in the installation.

Source: City of Columbus

3.3. DESCRIPTION OF CURRENT SYSTEM

3.3.1. Organizational Structure

The following section shows how the NEMT transportation system currently flows from ODM to the member. **Figure 11: Current System NEMT Transportation Providers** is a visual representation of the process.



Source: City of Columbus

Figure 11: Current System NEMT Transportation Providers

3.3.2. Ohio Department of Medicaid

ODM is the lead agency governing Medicaid services in the State of Ohio. As of January 2018, Ohio's Medicaid membership was about 2.9 million individuals[6]. Medicaid provides eligible recipients two healthcare delivery options, depending on their eligibility category. They are either enrolled in a managed care plan provided by the MCOs or they access services through the traditional Medicaid (fee-for-service) program. Fee-for-service allows Medicaid recipients to use the state's Medicaid approved network of providers for services and accounts for about 14 percent of Medicaid recipients. Managed care plans allow Medicaid recipients to use the MCO's approved network of providers for services and makes up the

[6] *Ohio Department of Medicaid.*

remainder, about 86 percent, of Medicaid members. The Medicaid member period is 12 months from the date initial determination was approved and is available for renewal annually based on the month of enrollment.

The federal government requires transportation to medical care be provided to Medicaid recipients. Transportation is a major benefit that ODM offers through either MCOs or County Departments of Job and Family Services.

NEMT, a frequently used transportation type, is used for Medicaid recipients where the member does not need emergency transportation to attend medical and health related appointments. Some examples of NEMT needs are for regular primary care physician check-ups and dental, eye, vision or Obstetrics and Gynecology appointments. The NEMT benefits provided by the MCOs and the counties will be discussed in greater detail in the following sections.

During the late fall of 2017, ODM issued a request for information as work began to implement a provision from the Fiscal Year 2018-2019 state budget bill that transitions responsibility for Ohio's NEMT from the state's current county-based system to a state-based brokerage model. While this change has been tabled due to the upcoming gubernatorial election, it is likely that a new, regional or statewide system around county delivery of Medicaid services will continue to be a goal for Ohio. This future change is unlikely to affect NEMT service delivery requirements for MCOs.

3.3.3. Managed Care Organizations

In Ohio, five MCOs have contracted with the State to provide Medicaid coverage to eligible residents.

- Buckeye Community Health Plan
- CareSource
- Molina Healthcare of Ohio Inc.
- Paramount Advantage
- United Healthcare Community Plan of Ohio, Inc.

Additionally, Ohio manages dually eligible Medicare-Medicaid individuals residing in 29 counties through health insurance companies called MyCare Ohio Plans (MCOPs). The following five MCOPs in Ohio offer two plans in each of the seven regions.

- Aetna
- Buckeye Community Health Plan
- CareSource
- Molina Healthcare of Ohio Inc.
- United Healthcare Community Plan of Ohio, Inc.

The number of enrolled members through MCOP that could become pregnant is extremely low and therefore, this PTA pilot will focus on the traditional MCOs.

As previously stated, MCOs provide transportation to medically necessary appointments as outlined in the MCO agreement with ODM. For example, MCOs provide NEMT for all medical appointments where members must travel 30 miles or more one way for care. Each MCO may also offer members additional benefits such as rewards programs for attending medical care appointments, completing a health screening

or getting a flu shot. Transportation is another area where the MCOs have decided to offer additional benefits to their members. Four of the five MCOs offer 30 one-way trips per member, per calendar year for appointments that are located within 30 miles of the member's home address. One MCO offers 60 one-way trips per member, per 12-month period for appointments located within 30 miles of the member's home address. All five MCOs allow trips to be used for medical appointments, Medicaid re-determination appointments with the Franklin County Department of Job and Family Services and Women, Infants and Children services. MCOs allow a stop at a pharmacy to pick up prescriptions on the way home from a medical appointment.

Each MCO also has additional pregnancy benefits for Prenatal Travelers including cash reward programs for attending prenatal doctor appointments. Some MCOs have also added transportation benefits for Prenatal Travelers including unlimited trips to prenatal appointments, one additional passenger in the car (additional passengers must be necessary for medical reasons or be children) and same-day transportation.

MCOs contract with TBs to provide transportation services to Medicaid members. The brokers' services include managing authorized trips and hiring NEMT Mobility Providers to conduct the transportation service. These brokers and their providers must comply with state and federal requirements to provide Medicaid transportation services.

NEMT Mobility Providers are the boots or "wheels" on the ground providing the actual transportation to the Medicaid member. NEMT Mobility Providers can come in all shapes and sizes and the TB does their best to right-size the vehicle for the transportation need. Transportation vehicle types include ambulettes (wheelchair vans), shuttles, ambulances, vans, and sedans. MCOs and TBs also use bus passes when it makes sense. Bus passes are normally for daily use but if a member has a certain number of appointments in one month, a monthly bus pass can be requested. Weekly bus passes may also be available if a member has more than two appointments in the same week. Some MCOs also offer mileage reimbursement if a family member or friend can drive the member to their appointment. This benefit needs to be approved in advance. Not all MCOs offer this benefit.

To schedule a trip, the member calls a designated call center phone number at least 48 hours in advance of the medical appointment. Most MCOs allow members to call up to 30 days in advance (period of Medicaid validation) of the appointment to schedule transportation. At the time of the transportation reservation, the member is responsible for sharing any additional/special needs for that trip, i.e. additional passengers, assistance needed from her home to the vehicle, etc. Members traveling with young children who, by Ohio law, require a car seat must supply their own car seat(s). The managed care plans vary on whether the member must be at the Medicaid registered address or another location for pickup and drop-off. The MCOs/TBs typically provide reminder calls to the member for their upcoming transportation reservation. The transportation provider may set a pickup time up to 1 hour in advance of the member's appointment time. For the return trip, the transportation provider typically gives the member a number to call to let it know when the member is ready for a ride home. The transportation provider must pick up the member within one hour of the call. For members who live 30 miles or more away from their medical appointment, the member must be picked up within 30 minutes. When scheduling the ride home, the member needs to notify the driver that an additional stop at a pharmacy is needed to ensure proper time is allotted for the trip. The MCOs would prefer members stop on the way home to receive and begin taking their medication as soon as possible. If a trip changes or cancellation is necessary, the member calls the designated call center to update the reservation.

Currently, no MCO offers an online portal or application to schedule transportation appointments.

3.3.4. Franklin County Department of Job and Family Services

FCDJFS receives funding from ODM to provide services to county residents enrolled in Medicaid, one of which is transportation.

The County provides an unlimited number of transportation rides to Medicaid eligible health appointments through two programs: Non-Emergency Transportation (NET) which focuses on anyone needing NEMT services and pregnancy-related services (PRS), which focuses on pregnant women. This ConOps only discusses the PRS program. The County issues a request for proposals every two years. Most recently, FCDJFS contracted with seven transportation providers: Airport Taxi, Bobcat Taxi, Best Choice, Super Shuttle, Arch Express, Kemper Shuttle and Metro Trans.

To schedule a ride, a member calls the County's Transportation Unit call center at least one business day in advance. The call center is open Monday through Friday from 7 a.m. to 5 p.m. FCDJFS checks the member's eligibility for Medicaid benefits in real-time through the ODM Benefits System. The member is told to be ready for pickup at least one hour prior to her scheduled appointment time. For the return trip, the driver will give the member a return slip with contact information, so the member can alert the driver when she is ready for pickup. Pharmacy pickups need to be scheduled in advance if the member wants to stop on the way home after the medical appointment. All changes and cancellations need to be made through the Transportation Unit call center.

During the last three months of a woman's pregnancy, FCDJFS also allows the member to call the taxi cab company directly after the call center's normally scheduled hours to arrange immediate transportation. This enhanced service is in effect until the baby is 2 months old.

During 2017, FCDJFS reported 120 trips were requested through their PRS program at a cost of $609 for completed trips. FCDJFS does not track the trips by zip code to know how many of those trips were requested in the pilot zone for this project.

3.3.5. Medical Offices

While Medical Offices don't have a technical role in the NEMT service delivery system, they can be significantly affected when NEMT services go wrong and are at a disadvantage from the lack of communication from NEMT Mobility Providers. Medical Offices schedule patients throughout the day based on the type of appointment they have and build an "emergency visit" and last-minute cancellation calculation into their planning. Medicaid no-show rates tend to be around 30-50 percent based on stakeholder feedback. While they could not attribute it to transportation through collected data, anecdotally transportation was to blame when they spoke to members. Medical offices do not have the ability to know if a patient is running late, has cancelled or missed the NEMT trip or to know when the NEMT service will pick the patient up after an appointment. This lack of information can lead to delays for other patients, cancelling a patient's appointment or having an overflowing waiting room while patients are waiting for NEMT pickup.

3.3.6. Transportation Broker

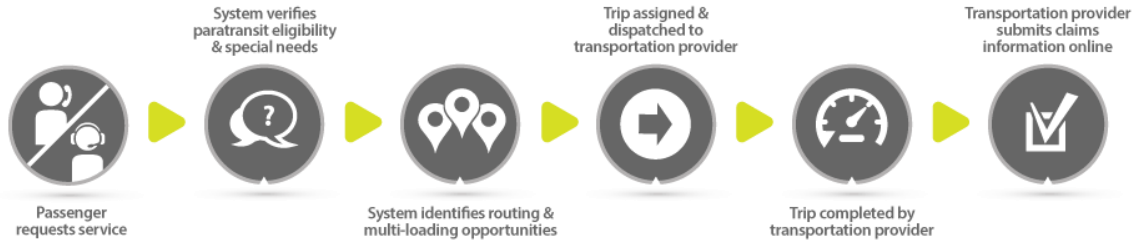
TBs are hired by MCOs to deliver the NEMT services prescribed by law and any extra trips offered. The TB will then hire NEMT Mobility Providers to provide the actual transportation. TBs operate the call center where the member calls to make a reservation. They answer the phone on their client's behalf, so the member does not realize she is calling the broker. The TB requests the member's name and MCO member identification then verifies their Medicaid eligibility. Eligibility is verified by the Ohio Benefits System. The MCOs have access to a list created by ODM which the MCOs scrub down to the relevant data and share with the TBs. ODM and the MCOs also have additional changes to the member eligibility list that occur

throughout the month (new members), which are shared with the TB. This benefit list transfer is done by emailing a file from the MCO to the TB.

Once eligibility is confirmed, the call center staff collects information about where the member is going, the time of the appointment, any special needs, i.e. guests that might be accompanying the member, and gives the member a confirmation that the ride has been set. The TB takes the NEMT request and right sizes it with the right vehicle and considers other trips scheduled for that day. The member is given the name of the company who will service the ride and the window of time that the ride could pick them up.

The TB has contracts with multiple NEMT Mobility Providers that can provide a variety of vehicles from sedan to ambulance. Complaints and compliments about NEMT services are directed to the MCO, though some complaints do come to the TB first.

Figure 12: Prenatal Traveler NEMT Trip Flow Chart shows the NEMT request and trip flow from the NEMT Mobility Provider's perspective (NEMT mobility provider is shown as transportation providers in this figure).



Source: MTM Transportation

Figure 12: Prenatal Traveler NEMT Trip Flow Chart

3.3.7. Non-Emergency Medical Transportation Mobility Provider

TBs hire NEMT Mobility Providers to service NEMT reservations. NEMT Mobility Providers can have a myriad of vehicles to use for services, but for PTA purposes, sedans are the main types of vehicles used for these trips. These NEMT Mobility Providers are given a list of reservations to service. Some TBs give the NEMT Mobility Providers a software application to use to transfer information or a device for drivers to use to pull up the information.

Once a driver arrives at a destination, if the member is scheduled for a return trip, the driver gives his or her name and phone number for the member to call the driver directly. Members can preschedule a return trip, but it is discouraged as most appointments do not have predictable end times. The return trip is a time of potential contention if the member wants to stop at a pharmacy to fill a prescription on the way home. Interviews with members have shown that some NEMT Mobility Providers refuse to stop at the pharmacy on the return trip unless it was requested with the initial reservation. During conversations with MCOs, they shared that the member has the right to stop on the return trip and the MCOs prefer it happens in that order, so a new trip is not necessary. Providing that return trip pharmacy stop allows the member to receive the prescriptions in a timely manner and is also more efficient in terms of cost and driver scheduling.

3.4. MODES OF OPERATION FOR THE CURRENT SYSTEM

This section describes the modes of operation for the current system, including the impacted user classes for each mode as shown in **Table 4: Modes of Operation for the Existing NEMT System of an MCO**. NEMT service delivery is currently a manual process which starts through a call center. There is no interconnectivity to track failed communications and actions of the parties in this process.

Table 4: Modes of Operation for the Existing NEMT System of an MCO

Mode	Definition
Operational (Regular)	Normal operating condition, the current system is operating as designed. The system is functioning during work hours.
Failure Mode	Failure mode represents a communication failure. Examples follow: • When a Prenatal Traveler does not show up for pickup no information is shared with the medical office (in case the appointment needs to be cancelled or rescheduled), • NEMT mobility provider does not respond to Prenatal Traveler return trip pickup request, and • ODM benefit list does not properly list the Prenatal Traveler even though they have benefits.
Maintenance	The condition of the current system where service is unavailable due to routine or unscheduled maintenance.

Source: City of Columbus

3.4.1. User Classes of the Current System

Table 5: Current System Users describes the user classes of the current system that includes the City, Prenatal Travelers, MCOs, TBs, NEMT Mobility Providers, ODM, FCDJFS and Medical Offices.

Table 5: Current System Users

User Classes	Description
The City/CelebrateOne	The City is comprised of City of Columbus employees who wish to partner with MCO's to facilitate PTA for Prenatal Travelers. The City through CelebrateOne has been collecting information around MCO delivery of NEMT services and has been working with the MCOs as partners in the fight against infant mortality.
Prenatal Travelers	Prenatal Travelers are end users of the current system (Medicaid members who are pregnant) who utilize NEMT services provided by FCDJFS or MCOs. There are about 3,700 Medicaid births per year in the eight CelebrateOne neighborhoods.
MCOs	MCO's are the Medicaid service delivery agents for the ODM. Specific to this project, they are responsible for providing NEMT to Prenatal Travelers. They contract with TBs to handle all aspects of the NEMT service delivery from call center, review and approval/denial of requests and contracting with NEMT Mobility Providers to execute the trip.
TBs	TBs connect NEMT mobility providers to MCOs and their members through the operation of a call center to handle all transportation related needs. TBs contract with the MCOs to deliver NEMT services through contracted NEMT Mobility Providers. When NEMT requests come in, the TB schedules the trip and assigns the appropriate vehicle to meet the needs of the Prenatal Traveler.
NEMT Mobility Providers	NEMT Mobility Providers deliver NEMT services to Prenatal Travelers and other Medicaid members. They can be taxis, limos, shuttles, ambulances or TNCs. They contract with a TB or with FCDJFS directly to deliver services.
ODM	The Ohio Department of Medicaid is the state department responsible for carrying out the state and federal laws, rules and policies around delivering Medicaid services. ODM contracts with MCOs and each of Ohio's 88 counties to deliver NEMT services.
FCDJFS	FCDJFS is a partner with ODM in delivering NEMT services. It receives direct reimbursement from ODM for supplying NEMT services for Medicaid members. Its services are a supplement to the MCO NEMT benefits and are also available to newly accepted Medicaid members before the member selects an MCO plan to join. FCDJFS has a special program for pregnancy related NEMT trips. FCDJFS has a call center that communicates with contracted NEMT Mobility Providers to schedule and execute trips.
Medical Offices	Medical offices do not have an obvious role in the NEMT service current system but the impact of the system on their business is important enough to make them a user. While the office staff can assist a patient by calling for the return trip making them a direct component of the system, it's the impact of the inefficiencies of the system that is more important. Due to the lack of communication in the current system, the office doesn't know if traffic will be making a patient late, if the patient cancelled the NEMT ride or if the patient was a no-show at the pickup location.

Source: City of Columbus

Chapter 4. Justification and Nature of Changes

NEMT is an important service that has emerged as a leading Smart City application. Columbus has committed to improving transportation for all residents, including access to healthcare. This chapter identifies the user needs developed for the PTA project and the justification of those user needs derived from existing city goals, working group sessions, and the outreach identified in the Stakeholder Engagement (see **Chapter 2 References**).

While the current system satisfies the basic needs for NEMT services, it does not currently provide technology that can improve the expectant woman's experience and thus encourage adherence to doctor visits. Technology can create an easier scheduling experience through more options than just a phone call. Technology can also provide options for customer service feedback, proper data collection, true on-demand services, trip optimization and additional safety features readily available through current TNC vendors in Ohio such as, the location of the vehicle delivering NEMT services or information about the driver's identity and vehicle.

Gaps in the current system may be summarized as:

- Scheduling NEMT trips is only available through a call center with no other options
- Access to on-demand transportation is limited
- City agencies don't control the trip data, and face obstacles when requesting trip data from NEMT Mobility Providers or MCOs
- Trips are not being optimized for real time changes
- There is a lack of communication between the Mobility Provider, Prenatal Traveler, and Medical Office
- Uncertainty in time of return trip makes providing service difficult and reduces Prenatal Traveler's acceptance of the system
- Medical Offices do not have insight into whether a Prenatal Traveler was a "no-show" or a trip has been cancelled which may trigger the need to reschedule the appointment
- Information on the driver of the vehicle is not available to the Prenatal Traveler
- No available real-time information on driver location and arrival time
- MCOs need a reliable method to receive complaints from members

The overarching objective of the PTA is to provide a convenient and easy to use scheduling experience based on the different types of technology available to the target population with a focus on efficiency and safety. These needs are especially prevalent when dealing with pregnant women in these CelebrateOne neighborhoods. Infant mortality rates in these neighborhoods are almost twice as high as the U.S. average.

Furthermore, the lack of a reliable and easy to use system, can be a deterrent for some expectant women to seek the medical attention they need during their pregnancy.

4.1. JUSTIFICATION FOR CHANGES

The PTA will address primary gaps in the current system that are unmet under existing conditions. By satisfying these needs, the PTA will achieve its objective of providing a convenient smartphone application/web portal and call center where Prenatal Travelers can schedule NEMT trips that can be delivered on-demand and with the safety features available with today's existing technologies. Table 6: Justification for Changes outlines the improvements the PTA offers above and beyond the existing system.

Table 6: Justification for Changes

User Class	Current Situation	Benefit of PTA
Prenatal Travelers	Travelers do not have access to a smartphone application or web portal to schedule NEMT trips.	PTA will provide Prenatal Travelers with a free smartphone application, web portal and a call center to schedule NEMT trips.
Prenatal Travelers	Prenatal Travelers do not receive vehicle or driver information when scheduling NEMT trips.	PTA will share details about the driver and his or her vehicle with the Prenatal Traveler to add an extra layer of safety. Driver information would include the driver name. Vehicle information would include make, model, color and license plate.
Prenatal Travelers	Prenatal Travelers must arrange a trip (48 hours is preferred, 24 hours is minimum) in advance from a pre-specified pickup location.	PTA will allow on-demand trip service from the Prenatal Traveler's current location to the Medical Office. PTA will also help with return trips back from the Medical Office.
Prenatal Travelers	Prenatal Travelers cannot see the vehicle location in real-time to estimate when it will arrive.	PTA will provide real-time location information of the Mobility Provider.
Prenatal Travelers	Prenatal Travelers typically receive one phone call reminder one to two days in advance of their trip which may not be adequate.	PTA will provide multiple reminders to Prenatal Travelers based on the method of communication they prefer.
Prenatal Travelers	Prenatal Travelers do not have a convenient way to give complaints or compliments.	PTA will provide multiple opportunities to leave feedback on the NEMT service.
Prenatal Travelers	Prenatal Travelers do not have NEMT options with car seats available upon pickup.	PTA will provide car seats through the NEMT Mobility Providers.
The City/CelebrateOne	The City/CelebrateOne does not have adequate data on NEMT services for pregnant women in the eight CelebrateOne neighborhoods.	The PTA will provide adequate data on NEMT services for pregnant women in the eight CelebrateOne neighborhoods. The City will have access to detailed travel data through integration with the Operating System. Information can be used to guide public policy decisions.

User Class	Current Situation	Benefit of PTA
Ohio Department of Medicaid	ODM does not have adequate data on NEMT services to make policy decisions.	PTA will provide data on NEMT services for pregnant women in the eight CelebrateOne neighborhoods. ODM will have access to detailed travel data through integration with the Operating System. Information can be used to guide public policy decisions.
MCOs	MCOs do not have adequate data on NEMT services to make operational decisions.	• PTA will provide data on NEMT services for pregnant women in the eight CelebrateOne neighborhoods. MCOs will have access to data from the PTA system. • This data will allow the MCOs to see when a reservation request was made, a ride was executed and in the case of a no-show complaint, how long a vehicle waited at the pickup address. • MCOs will have an easier way to gather and address complaints with this information.
NEMT Mobility Providers	NEMT Mobility Providers do not have contact information for the Prenatal Traveler to assist with efficient service delivery.	PTA will provide Prenatal Traveler contact information through anonymized methods to allow the driver to call the Prenatal Traveler if there is a service delivery issue.
Medical Offices	Medical Offices do not have any information available on the patient's NEMT services.	PTA will share information with Medical Offices when a patient cancels her NEMT reservation, misses the NEMT pickup or when traffic is going to make the patient late for her appointment. This will allow the Medical Offices to make strategic decisions around additional outreach to the patient or moving patients around in the schedule to ensure no one should wait too long or miss her appointment. This information can provide insight into why someone might miss an appointment, i.e. transportation related issue.

Source: City of Columbus

4.2. DESCRIPTION OF DESIRED CHANGES

The PTA will add new capabilities over the existing system and integrate with the Operating System for improved access to travel data and system performance. The desired outcome of the PTA is to provide reliable, convenient, and efficient transportation services that benefit Prenatal Travelers and data around NEMT services to assist in future policy and business decisions. Enhanced NEMT services should encourage expecting mothers to attend prenatal doctor visits and other health related appointments. Doctor offices should experience lower no-show rates for Medicaid members. MCOs should see improved health care for expectant mothers and newborns. These expected results should help address pre-term birth which is one of the factors that affect infant mortality.

Table 7: User Needs contains user needs of the project as identified by stakeholder meetings, surveys, and use cases. Each need is given a combination of unique identifier and title for reference purposes in **Chapter 6. Operational Scenarios**. All user needs are grouped per User Class as defined in **Chapter 5. Concept for the New System**.

By meeting these user needs, the PTA will provide value beyond the current system and create a user-friendly transportation experience beginning with scheduling and ending with feedback on the completed trip. This value can be objectively evaluated by focusing on indicators of smartphone application, web portal and call center usage and customer satisfaction with the PTA. The Smart Columbus team will collect survey data directly from PTA users, as well as usage information from the technology vendor/TB, MCOs and the Operating System to better understand how customers are using the PTA, and how satisfied they are with the application. More detailed information on the types of information collected and the statistical analysis used to make inferences about overall application success will be forthcoming in the Smart Columbus Performance Measurement Document.

Table 7: User Needs

Identification	Title	Description	Rationale
PRENATAL TRAVELER NEEDS			
PTA-UN001-v01	Personal Devices	Prenatal Travelers need the PTA system to offer a free account-based smartphone application that can be downloaded and installed on their personal devices from public app stores. The PTA system needs to operate on Android and iOS devices.	To support a range of devices at no charge to encourage downloads and usage.
PTA-UN002-v01	Trip Scheduling	Prenatal Travelers need the PTA system to offer means (smartphone application/mobile friendly web portal/call center) to schedule on-demand and pre-scheduled trips, change and cancel transportation and change personal information.	To provide convenient scheduling options for Prenatal Traveler.

Identification	Title	Description	Rationale
PTA-UN003-v01	Graphic User Interface (GUI) (Transaction Equipment)	• Prenatal Travelers need the PTA system to provide a GUI to interact with the application. The GUI needs to display maps, text and other graphical information to allow effective use of the application. • Prenatal Travelers need the PTA system to offer an interactive map that shows real-time movement of their transportation before pickup.	To allow Travelers to interact with the application.
PTA-UN004-v01	Delay of Arrival or Cancellation of Trip Request	Prenatal Travelers need the PTA system to notify the Medical Office if the travel is delayed or cancelled.	To inform Medical Offices of any delay or cancellation of the Prenatal Traveler's transportation to prompt rescheduling if necessary.
PTA-UN005-v01	Timely Return Pickup	Prenatal Travelers need the PTA system to provide timely pickup for the return trip from the medical office to home.	To provide a timely service.
PTA-UN006-v01	Vehicle and Driver Description	Prenatal Travelers need the PTA system to offer a description of the pickup vehicle (make, model, color) and driver (name).	To inform Prenatal Traveler of driver information for improved safety.
PTA-UN007-v01	Prenatal Traveler Notifications	Prenatal Travelers need the PTA system to provide configurable notifications/reminders before the pickup time.	To remind Prenatal Traveler of upcoming trip.
PTA-UN008-v01	Cancel or Change Option	Prenatal Travelers need the PTA system transportation reservation information notifications to have a cancel or change feature/link.	To account for unforeseen changes and allow for convenience and flexibility when traveling.
PTA-UN009-v01	Multiple Languages	Prenatal Travelers need the PTA system to communicate in English, Somali and Spanish.	To support the Traveler's preferred language.

Identification	Title	Description	Rationale
PTA-UN010-v01	User Preference	Prenatal Travelers need the PTA to store user preferences. User accounts will be password protected and the users will be able to change their passwords. Preferences include a type of communication notification, address of pharmacy or frequently visited medical office. User preferences should be optional configurations in the application.	To reduce or filter unwanted information and to place preferences in the system.
PTA-UN011-v01	Accept Bookings/ Reservations	Prenatal Travelers need the PTA system to accept input of origin, destination, and time of departure to book/reserve trips (both to and from an appointment) using the PTA system in accordance with the policies of individual service providers and to receive confirmation that bookings/reservations have been processed and accepted.	To provide the convenience and flexibility of using a single source to book/reserve NEMT trips.
PTA-UN012-v01	Delay/ Cancellation Notification	Prenatal Travelers need the PTA system to notify them if a reserved trip is delayed or cancelled.	To be informed of changes to a scheduled trip and to adjust as needed.
PTA-UN013-v01	Access to Instructions and Educational Material	Prenatal Travelers need the PTA system to provide access to limited instructions to facilitate understanding and adoption. Instructions will be accessible, such as help with navigation or how to access account information. Prenatal Travelers will have access to educational material, such as frequently asked questions or how-to videos. Access to instructions and educational material does not constitute training, either web-based or in-person.	To offer guidance on how to operate the application or website.
PTA-UN014-v01	Trip History	Prenatal Travelers need the PTA system to provide the ability to view the number of trips allotted under their benefits and their trip history (how many trips have been taken) to have a complete record of all travel.	To have a complete record of all travel.

Identification	Title	Description	Rationale
PTA-UN015-v01	Feedback	Prenatal Travelers need the PTA system to provide the ability to submit feedback on the smartphone application. This information will be used by the MCOs and the City to determine whether the application is working as intended and to make enhancements.	To communicate likes and dislikes while using the app.
PTA-UN016-v01	Offline Usage	Prenatal Travelers need the PTA system to provide the ability to continue using the application when internet connectivity is temporarily unavailable to allow for uninterrupted use. This ability may be limited to static data or map cache for the current trip.	To allow for limited, uninterrupted use when there is no internet connectivity.
PTA-UN017-v01	Trip Optimization	Prenatal Travelers need the PTA to provide trip optimization services (routing engine) to determine the best route options.	To determine the best route options for Travelers based on available data from Mobility Providers and user preferences.
PTA-UN018-v01	Security and Encryption	Prenatal Travelers need the PTA system to encrypt communications to hide information from those not authorized to view it.	To protect Traveler information from those not authorized to view it.
PTA-UN019-v01	Car Seat	Prenatal Travelers need the NEMT Mobility Providers to offer car seats in their vehicles.	To allow safe rides for children passengers.
PTA SYSTEM NEEDS (TECHNOLOGY VENDOR/TB)			
PTA-UN020-v01	Open Standards	The Operating System needs the PTA system to support exchange of data through open APIs.	To share data with the Operating System.

Identification	Title	Description	Rationale
PTA-UN021-v01	Account Ownership	The PTA system needs to retain "ownership" of Prenatal Traveler accounts that are registered with it to protect participant information. In other words, if a customer registers an account with the PTA system, the account is owned by the System. "Ownership" is defined as the single point of entry for the customer.	To protect participant information.
PTA-UN022-v01	Trip Data	The PTA system needs to provide trip data to allow the City and MCOs to make informed decisions regarding future improvements to the pilot itself and to support broader transportation policy decisions. Trip data should consist of, at least, the following and pertains only to an executed trip: trip request (time, origin, destination, route), trip start time, mode, and trip end time. The trip should reference all trip activity. Trip data will not contain personally Identifiable Information (PII) that could potentially identify a specific individual.	To allow for policy making around NEMT service.
PTA-UN023-v01	Driver and Vehicle Info	The PTA system needs NEMT Mobility Providers to provide driver and car details to allow Prenatal Travelers to identify cars and drivers during pickup. NEMT Mobility Providers will be responsible for performing background checks to ensure drivers have clear driving records to ensure Prenatal Traveler safety.	To provide additional safety measures for the Prenatal Traveler.
PTA-UN024-v01	PTA-MCO Integration	The PTA system needs to integrate with the MCOs to transfer data and check Medicaid eligibility.	To ensure the Prenatal Traveler is still an MCO member and eligible to receive benefits.

Identification	Title	Description	Rationale
PTA-UN025-v01	Medical Office Integration	The PTA system needs to integrate with the Medical Offices to send notification information about a Prenatal Traveler's NEMT service.	To allow Medical Offices to take additional scheduling steps based on Prenatal Traveler's information.
PTA-UN026-v01	Request Accessible Vehicles	The PTA system needs to provide qualifying Prenatal Travelers with disabilities the ability to request an accessible vehicle. The PTA system needs to store this information to prevent having to re-enter the same request for each subsequent trip.	To accommodate special vehicle needs for qualifying Prenatal Travelers with disabilities.
OPERATING SYSTEM NEEDS			
PTA-UN027-v01	Access to Data	The City needs access to data generated by the PTA system.	To guide public policy decisions.
PTA-UN028-v01	Certification and Accreditation	The City needs a certification and accreditation provider to assess the quality, security, and "openness" of the System, to ensure the System meets user needs. Quality is defined as the state of being free from defects, deficiencies and significant variations, and is achieved through demonstration of the ability to satisfy user needs. Security is defined as the state of being protected against the unauthorized use or loss of information, especially electronic data, and the measures taken to achieve this. Openness refers to the adherence to open standards and design to ensure the System or aspects of the System are beneficial to other cities as part of the Smart Cities initiative.	To ensure the PTA system meets the user needs and the goals of Smart Columbus demonstration project.
PTA-UN029-v01	Open API for Data Transfer	The Operating System needs data provided through open APIs to be structured and machine readable and follow the open data standards and schema defined by data.gov (https://www.data.gov/opendata/).	To transfer data from the PTA system to the Operating System for City and Third-Party use.

Identification	Title	Description	Rationale
OHIO DEPARTMENT OF MEDICAID NEEDS			
PTA-UN030-v01	ODM Data Access	ODM needs access to data (records/reports) from this project.	To guide policy decisions.
MCO NEEDS			
PTA-UN031-v01	MCO Data Needs	MCOs need the PTA system to allow access to all data (scheduled, modified and cancelled trips, missed trips, number of times a member visits) via a portal (phone or website).	To guide policy and business decisions.
PTA-UN032-v01	MCO-PTA Integration	MCOs need the PTA system to provide easy integration with their current system and with their NEMT Mobility Provider's System.	To keep implementation costs down.
PTA-UN033-v01	PTA System Easy-to-Use	MCOs need the PTA system to be an easy-to-use program for Medicaid members of varying levels of education and technology understanding.	To ensure all eligible participants will be able to use the system.
PTA-UN034-v01	Fraud Prevention	MCOs needs the PTA system to prevent fraud and abuse of NEMT services through data collection of trips taken and pickup and drop-off locations.	To protect Prenatal Traveler information.
PTA-UN035-v01	MCO Training	MCOs need the PTA system to offer training for their case workers and call centers on new system.	To ensure case workers can use the system and can assist Prenatal Travelers with questions about the system.
PTA-UN036-v01	Proper Licensing	MCOs need TB and NEMT Mobility Providers to have any required certifications or licensing by the state or federal government.	To ensure TB and NEMT Mobility Providers have been properly vetted to provide these services.
PTA-UN037-v01	MCO Complaints	MCOs need the PTA system to capture transportation complaints from members and drivers.	To guide policy and business decisions.
CELEBRATEONE NEEDS			
PTA-UN038-v01	CelebrateOne Data	CelebrateOne needs access to the pilot data.	To guide policy decisions.
NEMT MOBILITY PROVIDER NEEDS			

Identification	Title	Description	Rationale
PTA-UN039-v01	Driver Training	NEMT Mobility Providers need the PTA system to provide easy to use, easy to train applications for their drivers to use or use their existing on-demand routing applications through APIs.	To ensure usage by the NEMT Mobility Providers.
PTA-UN040-v01	Driver Feedback	NEMT Mobility Providers need the PTA system to provide an easy to use feedback feature (how was the Prenatal Traveler during the ride).	To guide policy and business decisions.
PTA-UN041-v01	Driver Routing	NEMT Mobility Providers need the PTA system to provide real-time routing optimization.	To make efficient transportation decisions.
PTA-UN042-v01	Driver Communication and Preference	NEMT Mobility Providers need the PTA system to establish a way to communicate with a member through the preferred means of communication set up by member (phone, app alert, email or text).	To ensure last minute transportation issues can be communicated effectively.
PTA-UN043-v01	Driver Situation	NEMT Mobility Providers need the PTA system to know when they have the member in the car, are running late or member did not show.	To allow the PTA System to notify the Medical Office of a delay or cancellation of the Prenatal Traveler's trip.
MEDICAL OFFICE NEEDS			
PTA-UN044-v01	Medical Office Notification	Medical offices need to receive notice from the PTA System if a member cancels her appointment for transportation, misses a pickup* or is running late. *Just because someone misses a pickup does not mean she isn't coming to her appointment; however, this allows the office to decide if extra communication with the patient is necessary.	To guide business decisions around patient scheduling.

Source: City of Columbus

4.3. PRIORITIES AMONG CHANGES

The following priorities among changes listed in **Table 8: Priorities Among Changes** are classified as essential or desirable. Essential items are considered essential to the success of the PTA solution and must be included as part of the final solution. Desirable items are important to the overall system but may be excluded from the final solution on a case by case basis.

Table 8: Priorities Among Changes

Rank	Title	Priority Classification	User Need
1	Personal Devices	Essential	PTA-UN001-v01
2	Trip Scheduling	Essential	PTA-UN002-v01
3	Graphic User Interface (GUI) (Transaction Equipment)	Essential	PTA-UN003-v01
4	Delay of Arrival or Cancellation of Trip Request	Essential	PTA-UN004-v01
5	Timely Return Pickup	Essential	PTA-UN005-v01
6	Vehicle and Driver Description	Essential	PTA-UN006-v01
7	Prenatal Traveler Notifications	Essential	PTA-UN007-v01
8	Cancel or Change Option	Essential	PTA-UN008-v01
9	Multiple Languages	Essential	PTA-UN009-v01
10	User Preference	Essential	PTA-UN010-v01
11	Accept Bookings/ Reservations	Essential	PTA-UN011-v01
12	Delay/ Cancellation Notification	Essential	PTA-UN012-v01
13	Access to Instructions and Educational Material	Essential	PTA-UN013-v01
14	Trip History	Essential	PTA-UN014-v01
15	Feedback	Essential	PTA-UN015-v01
16	Offline Usage	Essential	PTA-UN016-v01
17	Trip Optimization	Essential	PTA-UN017-v01
18	Security and Encryption	Essential	PTA-UN018-v01
19	Open Standards	Essential	PTA-UN020-v01
20	Account Ownership	Essential	PTA-UN021-v01
21	Trip Data	Essential	PTA-UN022-v01
22	Driver and Vehicle Info	Essential	PTA-UN023-v01
23	PTA-MCO Integration	Essential	PTA-UN024-v01
24	Medical Office Integration	Essential	PTA-UN025-v01
25	Request Accessible Vehicles	Essential	PTA-UN026-v01
26	Access to Data	Essential	PTA-UN027-v01

Rank	Title	Priority Classification	User Need
27	Open API for Data Transfer	Essential	PTA-UN029-v01
28	ODM Data Access	Essential	PTA-UN030-v01
29	MCO Data Needs	Essential	PTA-UN031-v01
30	MCO-PTA Integration	Essential	PTA-UN032-v01
31	PTA System Easy-to-Use	Essential	PTA-UN033-v01
32	Fraud Prevention	Essential	PTA-UN034-v01
33	MCO Training	Essential	PTA-UN035-v01
34	Proper Licensing	Essential	PTA-UN036-v01
35	MCO Complaints	Essential	PTA-UN037-v01
36	CelebrateOne Data	Essential	PTA-UN038-v01
37	Driver Training	Essential	PTA-UN039-v01
38	Driver Feedback	Essential	PTA-UN040-v01
39	Driver Routing	Essential	PTA-UN041-v01
40	Driver Communication and Preference	Essential	PTA-UN042-v01
41	Driver Situation	Essential	PTA-UN043-v01
42	Medical Office Notification	Essential	PTA-UN044-v01
43	Car Seat	Desirable	PTA-UN019-v01
44	Certification and Accreditation	Desirable	PTA-UN028-v01

Source: City of Columbus

4.4. CHANGES CONSIDERED BUT NOT INCLUDED

4.4.1. Franklin County Department of Job and Family Services Inclusion

As discussed above, FCDJS provides NEMT services for both Medicaid Fee for Service members' and MCO Medicaid members who exhaust their MCO allocated trips. Including the PRS program NEMT trips from FCDJFS in the pilot was evaluated to ensure all prenatal NEMT trips were included. In 2017, there were only 120 trips given through the county's PRS program county wide. That number is significantly lower than was expected. The City decided not to include FCDJFS in the project because the cost to integrate the County outweighs the need for additional participants. The pilot was expanded from one neighborhood to eight for MCO members to fulfill that need.

4.4.2. Ohio Department of Medicaid Inclusion

Initially, partnering with ODM on this pilot seemed the best path forward during the planning phase. Upon meeting with ODM, it shared that a meaningful change in NEMT services provided by Ohio's 88 counties would be taking place in the next year. ODM would be moving to a centralized, statewide system with the goal of creating efficiencies and delivering the same services no matter which county a member lived in. They were unable to share additional details about the coming changes which will now take place under Ohio's new Governor. The PTA project will not include ODM as the lead partner in this project. ODM will be kept apprised of the project process and milestones and may share data to assist with the study protocol.

4.4.3. Smartphone Only Solution

A major component of this pilot is the smartphone application which puts scheduling an expectant mother's next ride in the palm of her hand 24/7. While studies have been done to show that many of the Medicaid recipients or CelebrateOne zone residents have cell phones, they may not have a smartphone, only have limited minutes/data available or they may not have the same phone number from month to month. The City is scoping the PTA project to ensure that the new system will benefit all pilot participants regardless of smartphone availability by having a web portal and pilot specific call center available.

4.4.4. Timeline Expansion

Pre-term birth is any birth prior to 37 weeks of gestation which will be covered by the pilot timeline. Infant mortality, as discussed above, has many factors and can be viewed as a 22-month endeavor. Given the purpose of this pilot is to focus on prenatal trips to see if a more on-demand service could impact a Prenatal Traveler's likelihood of going to her prenatal visits, the timeline was set to focus on the soon to be mother's health through pregnancy and two months of post-natal care. The City decided to add two months of infant care in as well based on input from CelebrateOne and the MCOs. MCOs pregnancy programs run through two months after birth.

4.4.5. Scope Expansion

The City and MCOs evaluated the extra burden on the Prenatal Traveler to continue to use existing MCO information for the rest of her family for NEMT while using a special process/phone number for her own NEMT needs. The City decided that the cost would be too hard to estimate for varying family sizes and medical needs and therefore the pilot will cover only a Prenatal Traveler through her pregnancy plus two months after birth and the infant through the first two months.

Chapter 5. Concept for the New System

This chapter provides an overview of the proposed PTA system including its relationship with data sources, NEMT Mobility Providers and related Smart Columbus projects. This section also includes the goals for the new system, modes of operation, classes of users, and interfaces with other systems. A description of key concepts and the rationale for decisions is included. In addition to the scope of the new system, connections to the other Smart Columbus applications are described in detail.

5.1. BACKGROUND, OBJECTIVES AND SCOPE

The USDOT's Smart City Challenge, launched in December 2015, was designed to encourage mid-sized cities to develop ideas for an integrated smart transportation system that would use data, applications, and technology to help people and goods move more quickly, cheaply, and efficiently. As part of Columbus's overall response to the Smart City Challenge, Mayor Ginther and other city leaders focused part of their efforts on how an integrated smart transportation system could be a ladder of opportunity and elevate transportation services for Prenatal Travelers. Increasingly, citizens in urban areas view mobility as a service, and expect on-demand services. Motivation for the PTA project focused around this discussion, as well as gaps that are present in the current system, such as the delays in pickup times, lack of multiple reminders and communication between users and ability to schedule from a smartphone application or computer, and integration with a trip optimization system. The PTA will provide this functionality and improve upon the existing functionality that is available to users of the current system.

The PTA has four main goals with respect to positive societal outcomes that tie back to the original intent of the Smart City Challenge:

- Enhanced Mobility
- Increased Opportunity
- Improved Efficiency
- Increased Customer Satisfaction

These goals were developed through collaboration with USDOT and address the unique needs of the Columbus region. A description of each of the goals is provided below.

5.1.1. Goal No. 1: Enhanced Mobility

Enhanced mobility within the context of the Smart Columbus program means providing citizens with improved access to transportation services, which in turn leads to an improved quality of life and access to economic and educational opportunities. Within the context of the PTA, enhanced mobility means providing Prenatal Travelers with convenient and reliable scheduling and transportation services.

5.1.2. Goal No. 2: Increased Opportunity

Providing opportunities for improved access to transportation is of vital importance to Smart Columbus and the PTA project. This goal aims to increase access for underserved communities to transportation solutions focused on increasing access to healthcare. Opportunity is created with the implementation of services that connect people with healthcare and improved quality of life. The PTA will create opportunity by addressing barriers to NEMT that Prenatal Travelers face when using systems that are not technologically advanced or designed to be on-demand.

5.1.3. Goal No. 3: Improved Efficiency

Smart Columbus will improve the ability of government, transportation, and healthcare agencies to provide services to citizens through integration with PTA. This will allow easier access to real-time data, streamline internal processes to improve communications and information sharing and make internal agency operations more efficient. Agency efficiency includes strategies to enhance agency coordination including improved inter-agency sharing of information and resources to reduce operating costs and/or enhance productivity. For example, implementing data sharing within the Operating System will provide a method to improve efficiency within user agencies by supporting communications and facilitating the usage of data and access to NEMT providers in agency programs to provide more efficient operations. Another efficiency will be the reduction of any manual processes currently being provided by the TBs. This could allow employees to focus on other important data collection and analysis.

5.1.4. Goal No. 4: Increased Customer Satisfaction

Smart Columbus will only be successful if it provides services that are useful, easy to use and embraced by the community. Smart Columbus will improve the user experience for Prenatal Travelers scheduling NEMT trips by notifying them of their appointments and allowing same day on-demand service to and from their medical provider. By implementing advanced technologies, such as providing fast access to vehicles through on-demand service through PTA, the products or services supplied by the City will meet or surpass a user's expectation.

5.1.5. Objectives

The objectives of the PTA are to facilitate access to easily schedule NEMT trips through advanced technology and to reduce the pickup time for a Prenatal Traveler by providing more on-demand, optimized transportation with real-time availability of the driver's location.

The objectives listed in **Table 9: Objectives of the Proposed System** address barriers to pregnant women attending prenatal appointments that the PTA project can influence. The overarching hypothesis behind these objectives is that by making scheduling NEMT easier, PTA can encourage more Prenatal Travelers to attend their prenatal appointments which means less risk to the unborn children which could lead to reduction in infant mortality.

Table 9: Objectives of the Proposed System

Objective	Hypothesis
Facilitate improved access to NEMT trip scheduling	The PTA will allow Prenatal Travelers to easily access NEMT trip scheduling via smartphone or website 24/7. Call center hours will be set by each MCO through their contract with the PTA system vendor.
Increase usage of the NEMT benefit	The PTA will result in increased ridership for NEMT services by affording Prenatal Travelers access to on-demand services.
Increase customer satisfaction	The PTA will increase customer satisfaction by providing an on-demand mobile and web-based application to schedule NEMT services, as well as, on-demand transportation services.

Source: City of Columbus
Note: The Smart Columbus Performance Measure Plan includes additional information to meeting objectives such as indicators, methodology and timeframe.

5.1.5.1. STRATEGY

The strategy to realize these objectives is to issue an RFP, in partnership with the MCOs to obtain a PTA solution from a private sector partner that addresses all of the primary gaps in the current system that motivate the project (**Table 6: Justification for Changes**). This ConOps document will drive the development of functional requirements for a minimal viable product that can be detailed in an RFP.

5.1.5.2. PILOT EXECUTION

As discussed above the study design of this transportation project specifically targets improving access to prenatal care and the reduction of pre-term births, the leading cause of infant mortality in Franklin County. The study approach around pre-term birth is encouraged by Dr. Courtney Lynch and Dr. Erinn Hade at OSU. Their insight indicates that infant mortality is a difficult metric to track changes on due to the multiple contributing factors and the overall small number of women impacted by it. The main issue at hand is that the expected effect size of the planned transportation intervention is expected to be relatively small. When we try to measure small differences in very rare outcomes like infant mortality, a study would need tens of thousands of women to have the statistical power to see the effect. This is why there aren't many infant mortality studies, especially around transportation. Dr. Lynch also noted that this project will still be able to track rates of infant mortality and report them when the records are available [at the latest, a child's first birthday (12-month lag)]. If a change in infant mortality was not observed, the project data would verify that the project was statistically underpowered to detect a change. However, if a decrease in preterm birth is seen, that would suggest an eventual impact on infant mortality (given that preterm birth is the primary cause) due to PTA.

To properly study the effects of the PTA project, the City has planned a pilot consisting of both an exposed and unexposed group. The exposed group will receive enhanced NEMT services and the unexposed will continue to receive their MCO specified NEMT services. Both groups will contain women who are less than 32 weeks pregnant, enrolled in Medicaid, need NEMT services and live in the CelebrateOne neighborhoods at the time of enrollment. The unexposed and exposed groups will be asked to opt-in to the pilot and will be tracked throughout their pregnancies and two months after delivery.

Table 10: CelebrateOne Neighborhood Births by Payer Source and Average Prenatal Visits, 2012-2017* shows the number of Medicaid births and total births that occurred in the CelebrateOne neighborhoods from 2012-2017.

Table 10: CelebrateOne Neighborhood Births by Payer Source and Average Prenatal Visits, 2012-2017*

CelebrateOne Areas	Zip Code(s)	# Births (Total)	# Births (Medicaid)
Linden	43211	2,616	1,697
Near East	43203, 43205	2,170	1,345
South	43206, 43207	6,114	2,989
Hilltop	43204	4,175	2,266
Franklinton	43222, 43223	3,583	2,368
Morse/161	43224, 43229	10,941	5,677
Northeast	43219	3,600	1,987
Southeast	43227, 43232	7,077	3,683
Total		**40,276**	**22,012**

Source: Ohio Department of Health Vital Statistics Data Analyzed by Columbus Public Health
** 2017 data are preliminary and subject to change.*

Participants in the exposed group will be provided with a new PTA system to request NEMT services. They will also be asked to download and use the PTA system smartphone application if they have a smartphone. If they do not have a smartphone but have access to a computer, they will be asked to schedule their NEMT needs through a web portal or by contacting a call center. NEMT services will extend beyond just prenatal medical appointments and will be inclusive of all NEMT services provided by MCOs during the pilot period. During the pilot period, the exposed group will have their NEMT and prenatal appointment attendance data collected. They will also be asked to respond to surveys to discuss their NEMT experiences.

Participants in the unexposed group will continue to schedule their NEMT needs through their MCO as they have always done. During the pilot period, the unexposed group will have their NEMT and prenatal appointment attendance data collected. They will also be asked to respond to surveys to discuss their NEMT experiences.

To ensure the pilot population is aware of this opportunity, this pilot will use focused, grassroots messaging and outreach. Initiating outreach through the MCOs would be difficult because the MCOs are not immediately notified that a member is pregnant. MCOs have shared that it could take a month or more before their maternal health team is notified of a pregnancy. Therefore, a focus on community events, local medical offices, churches and outreach through partners involved in the fight against infant mortality will be the first line of communication.

A main partner in this pilot will be a program called StepOne. StepOne is a one-stop resource for providing various services for pregnant women. It is an entry point for many women to learn about safe and healthy pregnancies, get enrolled in Medicaid and get an appointment with an obstetrician scheduled. When women call StepOne, they will be asked if they have Medicaid coverage from one of the two MCO partners, are less than 32 weeks pregnant and are interested in learning about a pilot opportunity around transportation. If the woman says yes, her information will be shared with the research team at OSU for a screening. If the

woman meets the qualifications and completes the baseline questionnaire, she will be admitted to the pilot and will be randomized into the exposed or unexposed group.

The pilot will last 16-18 months, depending on the delivery dates of the participants. Data will also be collected on Ohio's vital records for one year past the last participant's birth to review infant mortality data.

Based on feedback from the MCOs and CelebrateOne, incentives will be necessary for the participants in both the exposed and unexposed groups.

Data collection will be extremely important to make informed policy decisions on the future of NEMT delivery. With the help of City of Columbus Public Health epidemiologists, the following data types have been identified for collection:

- Number of trips taken
- Prenatal vs. other NEMT trip
- On-time performance of trips
- Number of missed trips
- Number of rescheduled/cancelled trips
    - Reason for cancellation
- How trip was scheduled
- Satisfaction
    - App feedback and surveys for drivers and members
- Prenatal appointments (Number attended vs. total number of prenatal appointments suggested by medical professionals)
- Cost of each trip
- Zip code of member and zip code where she delivered

5.2. OPERATIONAL POLICIES AND CONSTRAINTS

Operational policies and constraints in **Table 11: Operational Policies and Constraints** apply to the proposed system. Operational policies are predetermined decisions regarding the operations of each component or sub-component of the current system, typically in the form of general decisions or understandings that guide development and decision-making activities. Operational policies will inform decisions made to integrate with the PTA. Constraints are impediments outside of policy that restrict the PTA project from achieving its goal with respect to user needs and objectives.

Table 11: Operational Policies and Constraints

Type	Description
Constraint	The PTA must pass through data to the Operating System and adhere to the policies and technical requirements put forth by the Operating System team in order to share project data.
Constraint	Each MCO has its own TB, either in-house or through contract.
Constraint	PTA system vendor must be willing to integrate with the Operating System through open standards.
Constraint	MCOs and TBs generally are not willing to share cost comparison with potential competitor services. TNCs will only provide trip data (origin/destination) to public agencies that are subsidizing part of the trip. Discussions are underway to understand these constraints in more detail.
Constraint	The City needs the PTA system to be maintained and operated external to the City (because the City does not provide NEMT services).
Policy	Most NEMT Mobility Providers will not include car seats as an option for travel. Any use of car seats must come from and be installed by the Prenatal Traveler and must be taken with her to an appointment, so it does not stay in the vehicle.
Policy	The Operating System prefers that any third-party application deployed within the Operating System Microservice environment be open source, so that the Operating System as a whole can be replicable for other cities and not tied to specific third-party licensing and costs. Vendor applications and components will need to be evaluated on a case-by-case basis as to whether the Operating System will allow non-open-source applications.
Policy	The Operating System will restrict access to PII. PII data must be separated from trip data stored in the Operating System.
Policy	The City does not wish to be responsible for financial transactions related to PTA. It will grant the money necessary for the pilot to the MCOs to take on this role as a Grantee.
Policy	CelebrateOne and the MCOs will need to review and approve outreach or training literature that uses their logos.
Policy	ODM must approve all information related to the pilot that will be given to the potential and eventual pilot participants.
Policy	The pilot must be compliant with all ODM policies, regulations and/or rules[7] around NEMT delivery.
Policy	ODM and MCO contractual terms around NEMT delivery must be followed.

Source: City of Columbus

[7] *Detailed references are available in* ***Chapter 2. References.***

5.3. DESCRIPTION OF PROPOSED SYSTEM

The PTA system is a technologically advanced and user-friendly solution for prenatal Medicaid members to schedule NEMT trips. Prenatal Travelers can download and install the PTA application from public app stores and begin using it immediately to plan trips. They will also be able to visit a website or contact a call center to schedule their NEMT trip. MCOs will be the solution integrator so all payment information will be handled between the MCOs and the technology vendor/TB.

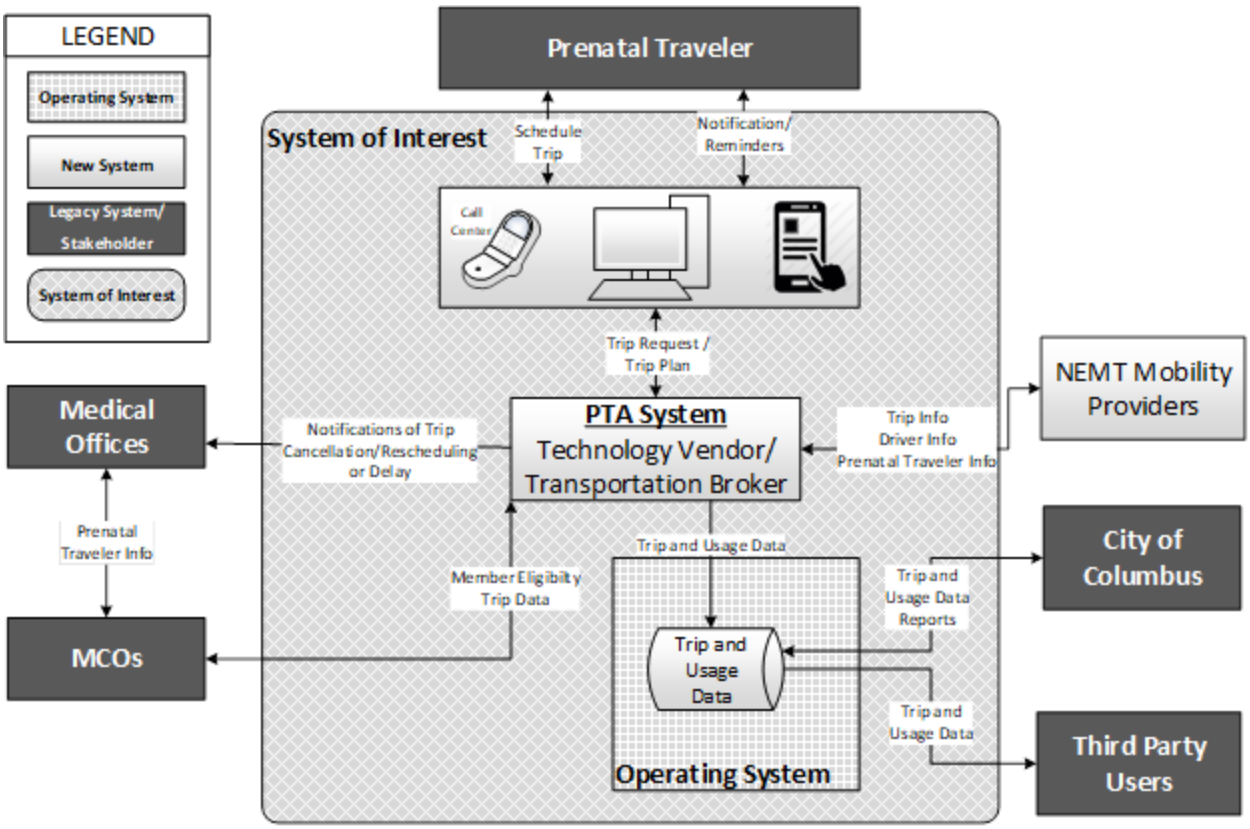
The PTA system will integrate with the Operating System to share trip data.

The PTA system will also integrate with medical offices to share information on Prenatal Traveler location and pickups to help minimize scheduling disruptions.

The Proposed System, as shown in **Figure 13: PTA Proposed System Context Diagram** , is organized into the following categories, starting with the PTA system as the central enabling technology for the entire system.

- PTA SYSTEM (Technology Vendor/Transportation Broker)
  - Trip Data
  - Interface with the Operating System
  - Interface with Medical Offices
  - Interface with MCOs
  - User Interface
  - Prenatal Traveler User Preferences
- Operating System
  - Trip Data
- MCOs
  - Trip and Payment Data
  - Member Eligibility
- Medical Offices
  - Trip Data
- NEMT MOBILITY PROVIDERS
  - On-demand Mobility Providers
- TRANSACTION EQUIPMENT
  - Smartphone Application
  - Prenatal Traveler Web Portal
  - Call Center

Figure 13: PTA Proposed System Context Diagram provides an overview of components and interconnections in the proposed system. Reference to external systems or procedures are included if applicable. The capabilities, functions, and features of each major component are described in this section. The PTA will be developed to optimize throughput, response time, and availability of all major system components as defined this section. **Figure 13** depicts the PTA as the System of Interest within the context of other Smart Columbus projects, external systems, and entities.



Source: City of Columbus

Figure 13: PTA Proposed System Context Diagram

5.4. SMART COLUMBUS OPERATING SYSTEM

The Operating System is the data platform at the heart of the Smart Columbus data environment that integrates data and data services from multiple sources, including the planned Smart Columbus projects, traditional transportation data, and data from other community partners. The Operating System embodies open-data and open-source concepts to enable better decision-making and problem solving for all users to support a replicable, extensible, sustainable platform.

5.4.1. Service Layer Application Programming Interfaces

The Operating System Service Layer will be comprised of open APIs and an API Builder, allowing for creation of customized data feeds. City of Columbus users and third-party users will have filtered access to PTA trip and anonymized payment data stored in the Operating System through APIs.

5.4.2. Trip Data

Trip data generated by the PTA will reside in a “big data” environment within the Operating System that is comprised of data storage and data retrieval systems and functions. Trip information will be collected into the Operating System in real time as generated and periodically archived to a historical database. Trip information will consist of at a minimum the following: origin, destination, whether trip was scheduled in advance or on-demand, trip start time, trip end time, type of trip and vehicle identification.

5.5. TRANSACTION EQUIPMENT

Transaction equipment includes any interface allowing a traveler to access the PTA services. This includes: web portal, call center and mobile application to support trip planning.

5.5.1. Prenatal Traveler Smartphone Application

Prenatal Travelers will be able to access their PTA accounts and schedule NEMT trips through a smartphone application.

5.5.2. Prenatal Traveler Web Portal

Prenatal travelers will be able to access their PTA accounts and schedule NEMT trips through a web portal. The web portal should be mobile friendly.

5.5.3. Prenatal Traveler Call Center

Prenatal Travelers will be able to access their PTA accounts and schedule NEMT trips through a call center.

5.5.4. Interface with Smart Columbus Operating System

The PTA will interface directly with the Operating System to send and receive trip planning information. PTA will pass along location information, such as origin and destination, as well as preferences to determine how results should be weighted and returned to the user as results.

5.5.5. Prenatal Traveler User Preferences

Prenatal Traveler user preferences can be selected by the users for the various methods of communications for reservation notifications, preferred pharmacy location, doctor’s office location and home address. For Medicaid NEMT trips, most MCOs will only allow the member to be picked up from their listed member address.

5.5.6. Incentives/Rewards

Prenatal Travelers may receive incentives and rewards for qualifying attendance at prenatal appointments through their MCO. This is an existing practice and will continue through the PTA demonstration. Other incentives are being reviewed for both the test and the control group as participation in this transportation pilot will involve extra work on the expectant mothers’ part whether it’s responding to a survey or ensuring that they use a different phone number or smartphone application to schedule their rides versus the rest of their family using the existing method of communication and transportation. Incentives may include COTA bus passes, baby needs – diapers, stroller or car seat or gift cards for grocery stores.

5.6. MANAGED CARE ORGANIZATIONS

The MCOs will continue their existing NEMT services and transfer of information with Medical Offices and ODM for those MCO members who are not involved in the pilot. For the pilot program, MCOs will contract with the PTA system technology vendor/TB to provide the PTA services described in this ConOps. They will transfer the ODM Benefits System list to the PTA system, so the PTA system can validate eligibility.

MCOs will receive NEMT trip data from the PTA system for verification of services and payment.

5.7. PRENATAL TRIP ASSISTANCE SYSTEM

The PTA system is the main component of the PTA pilot. The PTA system will be a web and smartphone-based software application that will be used to facilitate NEMT trips for expectant mothers enrolled in Medicaid from eight high risk neighborhoods. These trips will connect the pregnant women with prenatal and post-partum care appointments and accommodate additional needed stops/trips during the pilot as requested. This project will create NEMT efficiency, better customer service through reliable and convenient scheduling and vehicle driver and location information to boost the data available to allow government entities, MCOs and NEMT Mobility Providers to make better informed decisions.

The PTA system will ingest the NEMT reservation request through a web portal, smartphone application or call center input process. It will ensure the eligibility of the MCO member through a connection with the MCO who receives the information from the ODM Benefits System. It is unlikely that a direct connection from the ODM Benefits System will be available as the information that is passed to the MCO contains all Medicaid information on members including protected health information, most of which is not necessary to provide transportation. The necessary information will be transferred to the PTA system. Should any issues arise with the smartphone application or the web portal, the Prenatal Traveler will be able to call into the call center to receive service.

The PTA system will act in place of an MCO's current TB and transfer approved reservation requests to the appropriate NEMT Mobility Providers. In return, the PTA system will receive information about the assigned driver, their vehicle and general trip data.

The PTA system will send a confirmation of the transportation reservation and multiple notifications to the Prenatal Traveler to remind her of the upcoming transportation reservation. The methods of notification will be text, email or phone call. The reminder notifications will share the NEMT Mobility Provider's information, i.e. vehicle type and driver name. The reminder notifications will also allow for a quick touch text, return email or phone call response to cancel or change the reservation based on a changed appointment or need. This information would be relayed by the PTA System to the Medical Office, so it can initiate a reminder call to determine if the appointment also needs to be cancelled or rescheduled or if the Prenatal Traveler simply received another ride.

Finally, the PTA system will send email alerts to Medical Offices to share whether a patient has cancelled the NEMT trip, not shown up for an appointment or is on her way and stuck in traffic. This information will allow the Medical Office to decide if it should reach out to the patient to ensure she is on her way or, in the case of a traffic delay, adjust its schedule to take a patient who arrived early.

Trip optimization will be provided by the technology vendor/TB to ensure the most efficient route is taken for the Prenatal Traveler.

5.8. NON-EMERGENCY MEDICAL TRANSPORTATION MOBILITY PROVIDERS

NEMT Mobility Providers will contract directly with the technology vendor/TB who will be the provider of the PTA system to deliver NEMT trips. The PTA system will send the NEMT mobility provider trip assignments based on the Prenatal Travelers' reservation requests. The means for communicating the trip request to the Mobility Provider will be defined by the technology vendor/TB through the RFP process. The NEMT Mobility Providers will receive information on the Prenatal Traveler such as pickup location, drop-off location, time of scheduled appointment, special needs and number of guests.

In turn, the NEMT Mobility Providers will share their vehicle and driver information with the PTA system so it can be shared with the Prenatal Traveler. The System will also have access to vehicle location data to share with the Prenatal Traveler.

The NEMT Mobility Provider's driver can use the PTA system to give feedback on the Prenatal Traveler.

5.9. MEDICAL OFFICES

Medical Offices that are part of the PTA pilot will receive email notifications from the PTA system if a Prenatal Traveler changes, cancels or is running late during their NEMT trip. This notification is to assist the efficient scheduling taking place in medical offices. If a Prenatal Traveler changes or cancels her NEMT trip, it does not automatically mean that her appointment should also be changed or cancelled because it may be that she just found another ride. This notification would allow the medical office to take further outreach action with the Prenatal Traveler. It could call to check in to see if the appointment needs to be rescheduled. If it receives a notice of a delayed arrival, the Medical Office would be able to adjust its schedule appropriately and try to serve patients who arrived early and still manage to fit the Prenatal Traveler in seamlessly upon arrival.

The Medical Offices' connection to the MCOs is for payment and health data transfer.

5.10. MODES OF OPERATION FOR THE PROPOSED SYSTEM

The modes of operation for the PTA are defined in **Table 12: Modes of Operation for the Proposed System**. The PTA will include alert processes to make sure the problems are identified quickly, and the cause of the alert can be easily analyzed. Watchdog processes, used to detect and report failure or anomalies, will reside on separate servers from the process being analyzed.

Table 12: Modes of Operation for the Proposed System

Mode	Definition
Operational (regular)	Normal operating condition, the System is operating as designed and all processes are running as intended. The system is intended to function during all hours of the day. Watchdog processes are not activated when PTA data are within expected parameters.
Degraded Conditions	Represents a situation where primary functionality is lost due to nonfunctioning process or equipment, but an alternative (though less precise) means of accomplishing the function exists. This could be from back-up servers or processes.
Failure Conditions	Represents a situation where the application is not operating as designed and processes are not performing as intended. This could be from diminished communications between one or more external systems, diminished data quality, or the inability to process data in a timely manner. Failure conditions include situations that require temporary shutdown of the System. Watchdog processes will provide alerts for these failure conditions.
Diminished Communications	• Loss of Communication with Mobility Provider(s) – Loss of communications between PTA and NEMT Mobility Providers or end user. Loss of Ohio Benefits system resulting in loss of real-time benefit information. • Loss of Communications with the Operating System – Loss of communications between the PTA and the Operating System preventing transfer of data. Heartbeats will monitor the connection.
Deficient Data Quality	• Inaccurate Data – Inaccurate real-time vehicle location and availability from NEMT Mobility Providers. The application depends on the accuracy of this information to effectively plan routes and determine if services are running late. Inaccurate service data will greatly reduce the system's effectiveness. Actual trip data will be compared to estimates to determine data quality from each source. • Inability to Process Data in a Timely Manner – The amount of data requested to be processed in the PTA is greater than its processing capability, resulting in delays and/or unacceptable performance.
System Health Monitoring	• API Monitoring – Diagnostic health monitoring processes to ensure proper communication with NEMT Mobility Providers. Failure messages from these processes will alert required personnel. • Process monitoring – Diagnostic health monitoring processes to determine that Back Office processes are running as intended.
Maintenance	Condition in which equipment and/or systems are under repair or preventative maintenance.
Offline	Offline mode describes a situation where internet connection is lost, and the application is unable to retrieve real-time updates or operate as intended.

Source: City of Columbus

5.11. USER CLASSES AND OTHER INVOLVED PERSONNEL

A user class is distinguished by the ways in which users interact with the PTA. The PTA is comprised of all components and subcomponents that make up the PTA, providing Prenatal Travelers with the ability to schedule NEMT using a call center, web portal or smartphone application. Factors that distinguish a user class include common responsibilities, skill levels, work activities, and modes of interaction with the system. Different user classes may have distinct operational scenarios for their interactions with the system. **Table 13: Proposed System Users** describes the proposed PTA system users.

Table 13: Proposed System Users

User Classes	Definition
Prenatal Travelers	Prenatal Travelers are end users of the PTA who interact with the PTA to plan NEMT trips as provided by their MCOs.
The City/CelebrateOne	• The City is the facilitator of the PTA and is responsible for control of standards, regulations, and agreements between all stakeholders of the PTA. The City is responsible for developing needs and requirements for the PTA, and for deciding the policies and rules necessary to meet the goals and objectives of the overall Smart Columbus program. The City is responsible for establishing equal partnership with MCOs to ensure the best vendor is selected for the MCOs. The City is comprised of governmental staff with access to performance and usage information through integration with the Operating System. These users will have access to reports and performance measurement data to make informed decisions regarding future improvements to the System and to support broader transportation policy decisions. • CelebrateOne is a program within the City that is focused on reducing infant mortality. The program will use the data from the PTA to make policy decisions about future projects and spending. • The City is comprised of staff within the following departments as well as others: Mayor's Office, Columbus Public Health, Department of Development and Department of Public Service employees.
MCOs	MCOs will continue to service the Prenatal Travelers in the same capacity except as it relates to transportation for the test group. The test group will be placed in a separate category and their data will be shared with the PTA to schedule and execute NEMT. The MCOs will contract with the technology vendor/TB to use its PTA solution.

User Classes	Definition
Operating System (Smart Columbus PMO)	• The Operating System is the data platform at the heart of the Smart Columbus data environment. The Operating System is responsible for integrating data and data services from Mobility Providers, including Smart Columbus projects, traditional transportation data, and data from other community partners. The Operating System will store trip and usage data (non-PII) to support analytics and performance measures by the City of Columbus and third parties. • The Operating System will be operated by the Smart Columbus PMO. The PMO will continually monitor the operational performance and consider adjustments to the various systems to ensure that they are operating as expected. Further, the city will ensure that all performance measures and available data requested by the Independent Evaluator, and overall monitoring of the system, are being collected as documented and as required.
NEMT Mobility Providers	NEMT Mobility Providers are companies that provide transportation services to Prenatal Travelers. These companies provide location and trip data to the System through integration with the Operating System. NEMT Mobility Providers include public transit (COTA), TNCs and taxis.
ODM	• ODM will continue to maintain and allow access to its Ohio Benefits Portal for MCOs to check eligibility. ODM will also continue to make payments to the MCOs based on existing contracts to cover non-pilot and pilot participants. • ODM will receive the same data from the MCOs as it currently does but will also be receiving any data that comes into the Operating System.
Medical Offices	Medical Offices will accept notifications from the PTA system to allow for information around trip scheduling and en route status of the Prenatal Traveler.
PTA System (Technology Vendor/TB)	• The PTA system technology vendor/TB will be responsible for developing and implementing the PTA and hence must have a clear understanding of all system requirements, interfaces, and data flows and installation configurations for appropriate implementation. The PTA system technology vendor/TB will provide on-going support and maintenance for the PTA and ensure that security standards are maintained. The PTA system technology vendor/TB will also maintain relationships with the MCOs, Medical Offices and NEMT Mobility Providers to ensure proper support of the system. • The Technology Vendor/TB will contract with the MCO to provide NEMT trips for MCO members and will contract with NEMT Mobility Providers to provide those trips.

User Classes	Definition
Third-Party Users	Third-party users are members of the public, including researchers and entrepreneurs, with limited access to data that is generated by the PTA for development purposes. Third-party users access information through integration with the Operating System.

Source: City of Columbus

5.12. SUPPORT ENVIRONMENT

The support environment for this cloud-based PTA project consists of two main groups. The first is application solution providers that hold maintenance and service contracts with the MCOs. The second group is operations and maintenance staff from the Smart Columbus PMO. Both groups are described below.

Application solution providers will design, test, integrate, operate, and maintain one or more aspects of the PTA system. These private companies will be under contract with the MCOs and be responsible for providing a pre-determined level of maintenance and support in accordance with the terms of the contract. It is anticipated that the maintenance contract will include continuous agile development to update the user experience as needs are identified. No facility support is expected to be required.

The Smart Columbus PMO operation and maintenance staff will be responsible for monitoring public usage of the PTA via integration with the Operating System. They will also be responsible for maintaining the microservices in the Operating System and the operational and archived data in the system. The Smart Columbus PMO will be responsible for controlling access to the system data and processes, and for maintaining system security.

5.13. SECURITY AND PRIVACY

The PTA will be developed in accordance with best practices in data security and privacy. Data security refers to the tools, policies, practices, and procedures used to protect data from being accessed, manipulated or destroyed or being leveraged by those with a malicious intent or who are unauthorized to do so. Further, data security encompasses the corrective actions taken when data breaches are suspected or have been identified. Data privacy is the reasonable expectation that data of a sensitive nature will be kept confidential, sanitized and/or encrypted, and respectfully and responsibly maintained by all users, managers, and collectors of the data while adhering to applicable laws and regulations, policies, and procedures. Detailed system security as it pertains to the PTA will be documented in the Data Management Plan.

5.13.1. Personally Identifiable Information

The issue of PII security and management is critical to the PTA. The necessity to maintain data security across all components of the system is crucial to its success, and so protecting the PII of Prenatal Travelers needs to be a key priority.

The end user may wish to create an account within the PTA to store preferences that could simplify planning subsequent trips. Account information may include user name, e-mail address, work address, school address, home address, the address of other frequented destinations, and a preference for how to communicate notifications. The end user may also allow the PTA to know her current location to simplify entering her origin when scheduling an on-demand trip. Requirements for storing PII in the PTA will be addressed in the Data Privacy Plan. End user account information will not be distributed outside of the PTA. The PTA will utilize industry standard security mechanisms to protect the account information and the end user's privacy. Account information cannot be accessed or utilized without the end user's authorization.

To schedule NEMT trips, a Prenatal Traveler will open their PTA account with the option to remember her password, as well as home address, phone number and email to help with communicating reminders and notifications. This information will not be stored within the PTA to protect the end user's privacy. Account information cannot be accessed, utilized, or distributed without the end user's authorization.

Trip Activity Summaries generated by the PTA are sent to the Operating System for performance measurement and usage monitoring, and will not contain end user's PTA account information, but may contain user statistical data. These summaries will not identify individual travelers. While the City of Columbus may have access to origin and destination (O/D) information for internal use and federal reporting, access to this data by third-parties will be spatially anonymized to hide O/D.

5.13.2. Smart Columbus Operating System Security

The Operating System approach to security is to make sure that security is designed into applications, infrastructure and processes. The following standards provide guidance for that approach: the CIS standards found at CISecurity.org, The Open Web Application Security Project (OWASP) standards found at OWASP.org and the concepts of security in depth espoused by MIT. The OWASP framework is the most appropriate and recognizable reference point. http://owasp.org. Specifically, the "OWASP Proactive Controls" is a superb resource written by developers for developers. https://www.owasp.org/index.php/OWASP_Proactive_Controls.

The Operating System approach to security strategy aligns with OWASP's Top 10 Proactive Controls. Throughout our software development lifecycle, we will implement these safeguards within our code:

- Verify for Security Early and Often
- Parameterize Queries
- Encode Data
- Validate All Inputs
- Implement Identity and Authentication Controls
- Implement Appropriate Access Controls
- Protect Data
- Implement Logging and Intrusion Detection
- Leverage Security Frameworks and Libraries
- Error and Exception Handling

Chapter 6. Operational Scenarios

This section presents scenarios that capture how the system serves the needs of users when the system is operating under various modes of operation. An operational scenario is a description of a sequence of events that includes the interaction of products or services with its environment and users, as well as an interaction among its product or service components. The PTA system interacts with the users and the other systems in the following ways:

- **Prenatal Travelers**
  - Pre-trip
    - Establishes PTA account
    - Sets travel preferences
    - Accesses instructional and educational materials
    - Reviews trip history
    - Schedules/cancels/reschedules the trip
    - Receives notifications/reminders prior to trip
  - During trip
    - Gets assistance during trip
  - Post-trip
    - Provides feedback/complaints (right after trip or later)
- **Third-Party Users**
  - Post-trip
    - Accesses trip and usage data
- **Smart Columbus Operating System**
  - Post-trip
    - Shares trip and usage data
- **Medical Offices**
  - Pre-trip
    - Receives notification of trip cancelation/rescheduling
- **MCOs**
  - Pre-trip
    - Verifies member eligibility
  - Post-trip
    - Shares trip data
- **NEMT Mobility Providers**

- Pre-trip
  - Receives prenatal traveler information
  - Receives trip info
  - Receives trip schedule/cancel/reschedule requests
  - Confirms trip requests
  - Provides driver info

Operational scenarios are developed to capture the above interfaces. The scenarios are grouped into use cases, which correspond to the proposed system. Scenarios for each use case describe various modes of operations that are expected: normal operating conditions and degraded and/or failure conditions, as necessary. Each use case is accompanied by a process diagram that represents the exchange of information between actors, devices, and systems.

The following operational scenarios are included in this section:

- **Table 14: UC1-S1: Prenatal Traveler Installs and Launches the PTA**
- **Table 15: UC2-S1: Prenatal Traveler Establishes an Account and Sets User Preferences**
- **Table 16: UC3-S1: Prenatal Traveler Plans a Trip**
- **Table 17: UC3-S2: Prenatal Traveler Takes a Trip**
- **Table 18: UC4-S1: Users Connect to the Operating System for Data**
- **Table 19: UC5-S1: Failure Condition – Loss of Communications with the Operating System**
- **Table 20: UC5-S2: Failure Condition – Temporary Loss of Communications**

UC1-S1 discusses the pre-condition required for the PTA system interface with the Users.

UC2-S1 discusses the pre-trip planning interfaces including establishing a PTA account, setting up user preferences, reviewing previous trip history, and accessing information and educational material. This scenario also describes the pre-trip interfaces with the MCOs to verify eligibility.

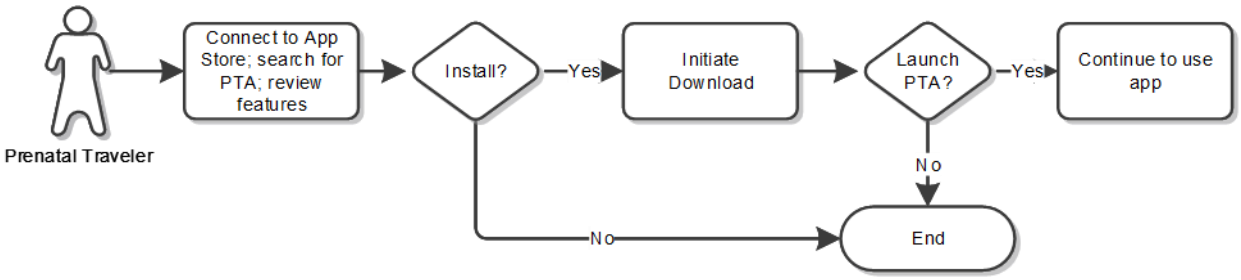
UC3-S1 discusses the pre-trip planning interfaces including scheduling, canceling, and rescheduling the trip, and trip notification. This scenario also includes a scenario for interfacing with NEMT Mobility Providers to reserve the trip and share the traveler and driver information.

UC3-S2 discusses the interfaces during the trip including notification, interfaces with Medical Offices for notification of a trip cancelation or reschedule, and NEMT Mobility providers to share traveler and driver information. This scenario also includes a scenario for providing feedback and complaints.

UC4-S1 discusses interfacing with the third-party to provide trip and usage data.

UC5-S1 and UC5-S2 discuss failure conditions.

Prenatal Traveler could potentially interface with the PTA through a mobile phone, website, or a landline phone (using IVR). The operational scenarios are developed based on the assumption that the Prenatal Traveler will use a mobile phone for the interface. We have identified the implications of the Prenatal Traveler using the website or landline phone in the “Comments” column.



Source: City of Columbus

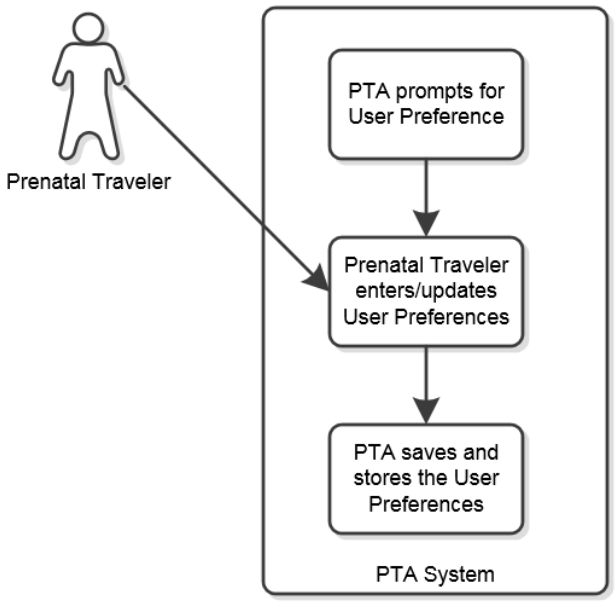
Figure 14: UC1-S1: Prenatal Traveler Installs and Launches the PTA

Table 14: UC1-S1: Prenatal Traveler Installs and Launches the PTA

Use Case	**Prenatal Traveler Installs and Launches the PTA**			
Scenario ID and Title	UC1-S1: Prenatal Traveler Installs and Launches the PTA			
Scenario Objective	Prenatal Traveler connects to a public app store to download and try the app			
Operational Event(s)	Install PTA, launch PTA			
Actor(s)	Actor	Role		
	Prenatal Traveler	End user of the system		
	PTA	Application (PTA could be smartphone, webpage or call center)		
	App Store	Public app store providing ability to download and install PTA		
Pre-Conditions	Prenatal Traveler owns a smartphone and it can download apps (turned on) Prenatal Traveler has access to app store Smartphone is connected to the Internet			
Key Actions and Flow of Events	Actor	Step	Key Action	Comments
	Prenatal Traveler	1	Prenatal Traveler connects to public app store and searches for Columbus PTA.	Prenatal Traveler has an Android phone and connects to the Google Play store. Travelers who have Apple phones would connect to the iOS App store.
	App store	2	The App store displays list of search results.	
	Prenatal Traveler	3	Prenatal Traveler selects PTA from list of search results.	

Use Case	Prenatal Traveler Installs and Launches the PTA			
	App Store	4	The App store displays PTA landing page with short description of app and links to "Read More". Also displayed are User Reviews, ability to "Rate this App", and option to Install.	Experience may vary depending on which App Store is required based on device type.
	Prenatal Traveler	5	Prenatal Traveler clicks on the Install button.	
	App Store	6	The App store commences download and installs on Prenatal Travelers's smartphone. When complete, prompts the Prenatal Traveler to "Open".	
	Prenatal Traveler	7	Prenatal Traveler selects Open.	
	PTA	8	The PTA displays a brief loading page and Terms and Conditions for use.	Regardless of device type, experience is the same for all smartphones.
	Prenatal Traveler	9	Prenatal Traveler accepts Terms and Conditions.	
	Prenatal Traveler	10	Prenatal Traveler closes the app.	
Post-Conditions	The PTA is installed on the Prenatal Traveler's device and ready for use			
Policies and Business Rules	N/A			
User Needs Traceability	PTA-UN001-v01 Personal Device PTA-UN003-v01 Graphic User Interface (GUI) (Transaction Equipment)			
Inputs Summary	N/A			
Output Summary	N/A			

Source: City of Columbus



Source: City of Columbus

Figure 15: UC2-S1: Prenatal Traveler Establishes an Account and Sets User Preferences

Table 15: UC2-S1: Prenatal Traveler Establishes an Account and Sets User Preferences

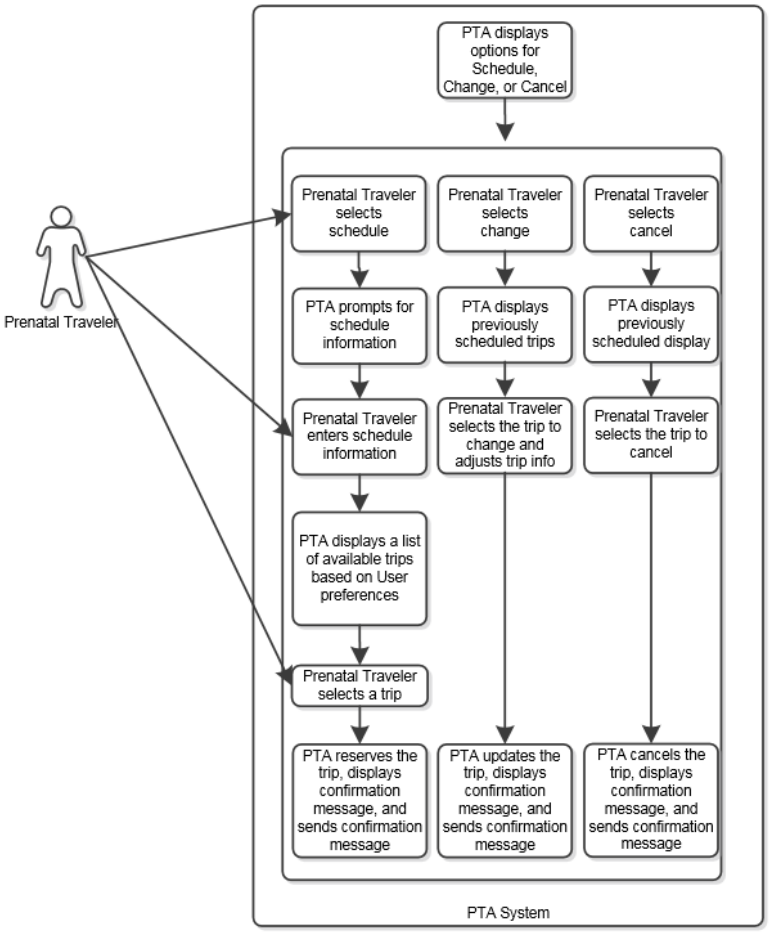
Use Case	**Prenatal Traveler Establishes an Account and Sets User Preferences**			
Scenario ID and Title	UC2-S1: Prenatal Traveler Establishes an Account and Sets Up User Preferences			
Scenario Objective	Prenatal Traveler establishes an account, adds user preferences to the app to customize the search results based on those preferences, reviews trip history and accesses informational and educational material.			
Operational Event(s)	Establishes an account, adds preferences, reviews trip history, accesses informational and educational material			
Actor(s)	Actor	Role		
	Prenatal Traveler	End user of the system		
	PTA	Application (PTA could be smartphone, webpage or call center)		
Pre-Conditions	Prenatal Traveler owns a smartphone Prenatal Traveler has downloaded and installed the PTA Prenatal Traveler has the PTA open Prenatal Traveler has access to a computer with internet Prenatal Traveler has access to a telephone			
Key Actions and Flow of Events	Actor	Step	Key Action	Comments
	Prenatal Traveler	1a	Prenatal Traveler opens the app in the smartphone.	

Use Case	Prenatal Traveler Establishes an Account and Sets User Preferences			
	Prenatal Traveler	1b	Prenatal Traveler opens the reservation webpage portal.	
	Prenatal Traveler	1c	Prenatal Traveler calls the call center number.	
	Prenatal Traveler	2	Prenatal Traveler establishes her PTA account and sets preferences.	Prenatal Travelers without access to smartphone or website may not be able to store the user preferences. PTA owns the accounts.
	PTA	3	PTA authenticates the user with appropriate credentials.	The PTA encrypts communications to hide information from those not authorized to view it for both the app and website. In case of a phone call, call center agent will authenticate the user credentials.
	PTA	4	The PTA validates member eligibility with the MCO.	The PTA is integrated with the MCOs to transfer data and check Medicaid eligibility. In case of a phone call, call center agent validates the member eligibility through a database sent to them by the MCO.
	Prenatal Traveler	5	To enter preferences, the Prenatal Traveler clicks on the “Configure” button.	

Use Case	Prenatal Traveler Establishes an Account and Sets User Preferences			
	PTA	6	The PTA displays favorite pickup locations, favorite pharmacies, and medical providers. Options for requesting language preference, an accessible vehicle, children's car seat(s), and how many children will be joining the mother for the trip. The User's preferred contact method for alerts/notifications will be displayed for the user to set up.	There will be two levels of preferences. One level will include general preferences and the second level will be preferences for an individual trip request. The Medicaid account information will be validated before trips are registered.
	Prenatal Traveler	7	The Prenatal Traveler clicks a link to return to the main screen.	
	Reviews Trip History			
	Prenatal Traveler	8a	The Prenatal Traveler selects Trip History option from the PTA.	
	PTA	8b	The PTA displays the number of trips allocated under Prenatal Traveler benefits and the trip history.	Prenatal traveler could alternatively call the call center to get the trip history information.
	Prenatal Traveler	8c	Prenatal Traveler exits the PTA.	
	Accesses Instructions and Education Materials			
	Prenatal Traveler	8a	Prenatal Traveler selects Instructions and Education Materials option from the PTA.	The PTA will share any outreach or training materials that reference ODM and Medicaid for approval, specifically, outreach from MCOs to Medicaid members.

Use Case	Prenatal Traveler Establishes an Account and Sets User Preferences			
	PTA	8b	The PTA displays the accessible instructions and educational materials including but not limited to PTA navigation, how to access education material, frequently asked questions or how-to videos.	This is not applicable to call center users since they won't access the app/website. They could call the call center to receive the information.
	Prenatal Traveler	8c	Prenatal Traveler exits the PTA.	
Post-Conditions	Prenatal Traveler has established a user account, added user preferences to the PTA to create reservations faster (except for telephone users), reviewed trip history and accessed informational and education materials.			
Policies and Business Rules	User preferences are included in each PTA transaction			
User Needs Traceability	PTA-UN001-v01 Personal Devices PTA-UN009-v01 Multiple Languages PTA-UN010-v01 User Preference PTA-UN013-v01 Access to Instructions and Educational Materials PTA-UN014-v01 Trip History PTA-UN018-v01 Security and Encryption PTA-UN021-v01 Account Ownership PTA-UN024-v01 PTA-MCO Integration PTA-UN026-v01 Request Accessible Vehicles PTA-UN032-v01 MCO-PTA Integration			
Inputs Summary	User preferences			
Output Summary	None			

Source: City of Columbus



Source: City of Columbus

Figure 16: UC3-S1: Prenatal Traveler Plans a Trip

Table 16: UC3-S1: Prenatal Traveler Plans a Trip

Use Case	**Prenatal Traveler Plans a Trip**	
Scenario ID and Title	UC3-S1: Prenatal Traveler Plans a Trip	
Scenario Objective	Prenatal Traveler schedules, changes or cancels a pre-planned on-demand trip	
Operational Event(s)	Schedules a trip, changes a trip, cancels a trip and provides feedback	
Actor(s)	Actor	Role
	Prenatal Traveler	End user of the system
	PTA	Application (PTA could be an app in the smartphone, webpage portal or call center)

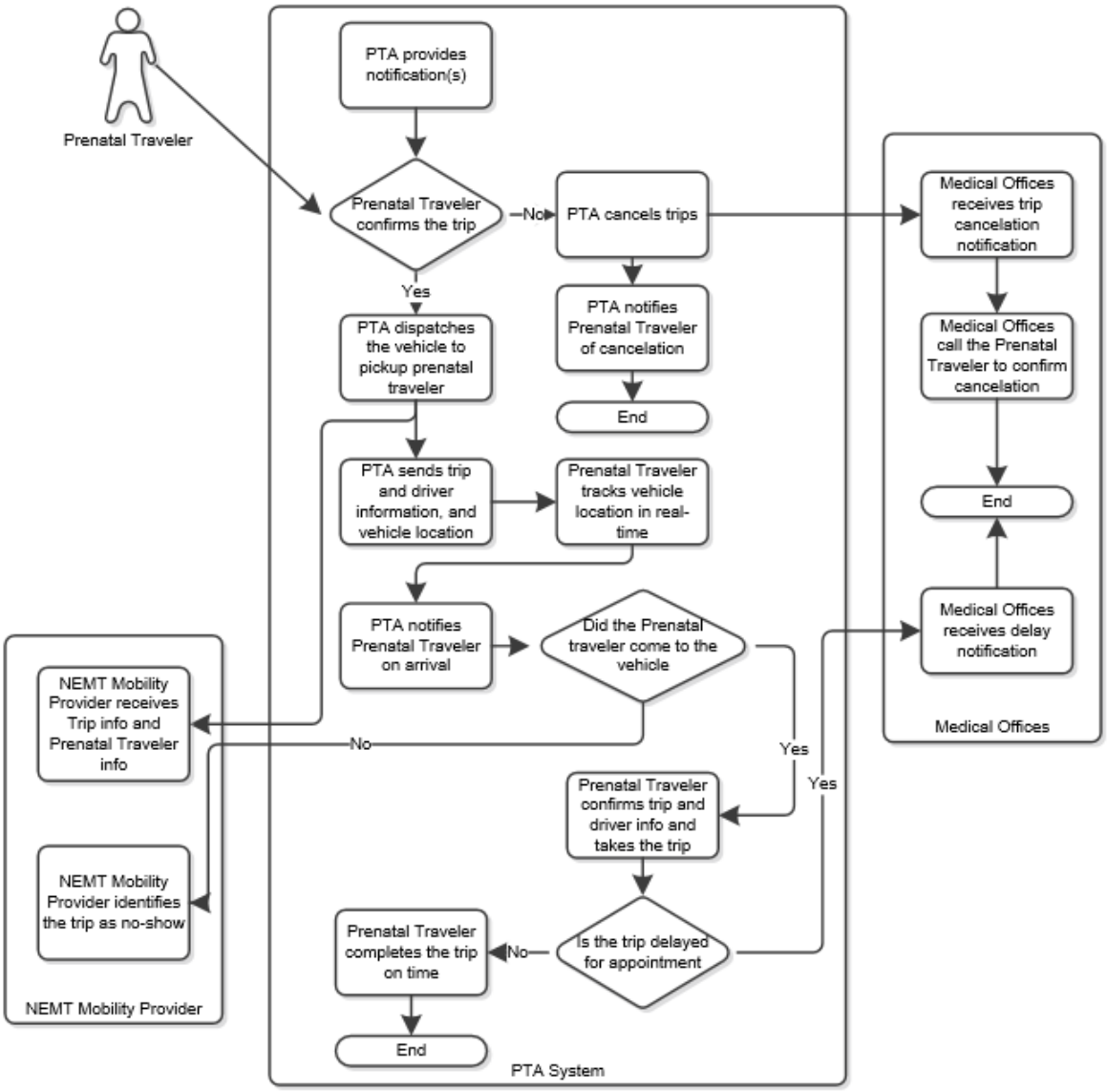
Use Case	**Prenatal Traveler Plans a Trip**			
Pre-Conditions	Prenatal Traveler has internet on the smartphone Prenatal Traveler has access to a computer with internet Prenatal Traveler has access to a telephone Prenatal Traveler has downloaded and installed the PTA Prenatal Traveler has established a PTA account			
Key Actions and Flow of Events	Actor	Step	Key Action	Comments
	Prenatal Traveler	1a	Prenatal Traveler opens the app in the smartphone.	
	Prenatal Traveler	1b	Prenatal Traveler opens the reservation webpage portal.	
	Prenatal Traveler	1c	Prenatal Traveler calls the call center number.	
	PTA	2	The PTA authenticates the user with appropriate credentials.	
	PTA	3	The PTA checks member eligibility with the MCO.	
	PTA	4	The PTA provides options to schedule a trip, change a previous scheduled trip, or cancel the previous scheduled trip	
	Schedules a Trip			
	Prenatal Traveler	5a	Prenatal Traveler selects schedule a trip option.	
	PTA	6a	The PTA displays a map image and prompts the Prenatal Traveler for doctor's office or other destination, date and time of appointment and pickup location.	Travel start time could be either on-demand or could be up to a month in advance. The defaults of these parameters will be displayed based on user preference settings.
	Prenatal Traveler	7a	Prenatal Traveler enters the requested information and requests reservation.	
	PTA	8a	The PTA automatically adjusts the trip results based on the Traveler's preferences.	

Use Case	Prenatal Traveler Plans a Trip			
	PTA	9a	The PTA displays the reservation opportunity.	PTA interfaces with the NEMT Mobility provide for the reservation. PTA shares the traveler information and trip data.
	Prenatal Traveler	10a	Prenatal Traveler confirms the reservation.	
	PTA	11a	The PTA reserves the selected trip and sends confirmation message to the user preferred communication method.	PTA interfaces with the NEMT Mobility provide for the confirmation.
	PTA	12a	The PTA displays a confirmation message.	When the time for the trip has come the traveler will be prompted to confirm the vehicle request. (See UC3-S2)
	Prenatal Traveler	13a	Prenatal Traveler exits the PTA.	
	Changes a Trip			
	Prenatal Traveler	5b	Prenatal Traveler selects change a trip option.	
	PTA	6b	The PTA displays pre-scheduled trips for selection.	PTA interfaces with the NEMT Mobility provide for obtaining the schedule.
	Prenatal Traveler	7b	Prenatal Traveler selects a previous scheduled trip for change.	
	PTA	8b	The PTA displays the doctor's office or other destination, date and time of appointment and pickup location.	
	Prenatal Traveler	9b	Prenatal Traveler adjusts the pickup location and requests reservation.	
	PTA	10b	The PTA automatically adjusts the trip results based on the Traveler's preferences.	

Use Case	Prenatal Traveler Plans a Trip			
	PTA	11b	The PTA reserves the schedule and sends the confirmation message to the user preferred communication method.	PTA interfaces with the NEMT Mobility provide for the confirmation.
	PTA	12b	The PTA displays a confirmation message.	
	Prenatal Traveler	13b	Prenatal Traveler exits the PTA.	
	Cancels a Trip			
	Prenatal Traveler	5c	Prenatal Traveler selects cancel a trip option.	Trips can also be canceled or changed by selecting the appropriate link in the alert sent to the traveler via email or text.
	PTA	6c	The PTA displays pre-scheduled trips for cancelation.	PTA interfaces with the NEMT Mobility provide for obtaining the schedule.
	Prenatal Traveler	7c	Prenatal Traveler selects a previous scheduled trip for cancelation.	
	PTA	8c	The PTA cancels the selected trip and sends the confirmation message to the user preferred communication method.	TB & Medical Provider are also notified of the cancelled trip. Medical Office may decide to contact the traveler to see if she has arranged other transportation.
	PTA		The PTA displays a confirmation message.	
	Prenatal Traveler	9c	Prenatal Traveler exits the PTA.	
	Provides Feedback			
	Prenatal Traveler	5f	Prenatal Traveler selects feedback and/or complaint from the PTA.	

Use Case	Prenatal Traveler Plans a Trip			
	PTA	6f	The PTA displays the feedback and/or complaint form.	Feedback could be potentially provided on the trip, driver, vehicle, or PTA in general. PTA will forward the complaints and feedbacks appropriately.
	Prenatal Traveler	7f	Prenatal Traveler provides feedback and/or complaint and exits the PTA.	In case of call center, call agent will register the feedback and complaints.
Post-Conditions	The Prenatal Traveler schedules, updates, or cancels the trip. She also provides feedback.			
Policies and Business Rules	N/A			
User Needs Traceability	PTA-UN001-v01 Personal Devices PTA-UN002-v01 Trip Scheduling PTA-UN003-v01 Graphic User Interface (GUI) (Transaction Equipment) PTA-UN008-v01 Cancel or Change Option PTA-UN011-v01 Accept Bookings/Reservations PTA-UN015-v01 Feedback PTA-UN037-v01 MCO Complaints PTA-UN040-v01 Driver Feedback PTA-UN028-v01 Certification and Accreditation			
Inputs Summary	Trip Preference			
Output Summary	Personalized trip itineraries			

Source: City of Columbus



Source: City of Columbus

Figure 17: UC3-S2: Prenatal Traveler Takes a Trip

Table 17: UC3-S2: Prenatal Traveler Takes a Trip

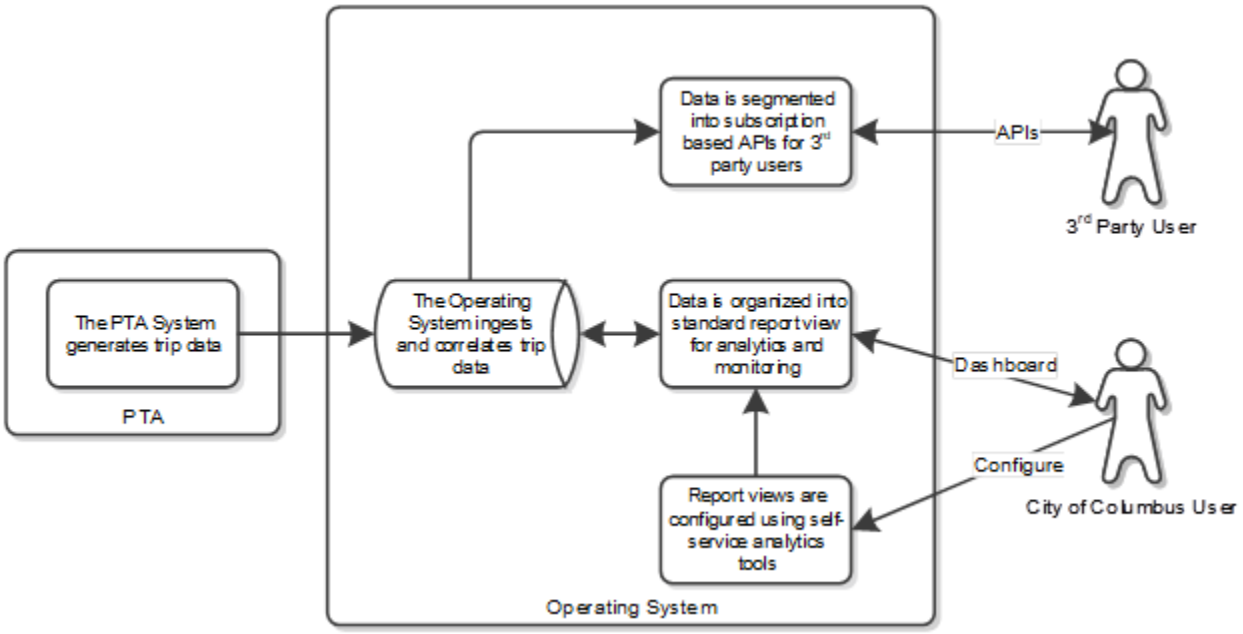
Use Case	**Prenatal Traveler Takes a Trip**			
Scenario ID and Title	UC3-S2: Prenatal Traveler Takes a Trip			
Scenario Objective	Prenatal Traveler receives notification, gets picked up, takes a trip, gets dropped off, notifies medical office			
Operational Event(s)	Receive notification, take a trip, get dropped off, notify medical office			
Actor(s)	Actor	Role		
	Prenatal Traveler	End user of the system		
	PTA	Application (PTA could be an app in the smartphone, webpage portal or call center)		
	Medical Offices	Receive notification		
	NEMT Mobility Provider	Provides transport services		
Pre-Conditions	Prenatal Traveler has downloaded the app on the smartphone Prenatal Traveler has internet on the smartphone Prenatal Traveler has access to a computer with internet Prenatal Traveler has access to a telephone Prenatal Traveler has downloaded and installed the PTA Prenatal Traveler has established a PTA account			
Key Actions and Flow of Events	Actor	Step	Key Action	Comments
	PTA	1	The PTA provides notification by email, text and/or phone for (as applicable) based on pre-defined schedules including confirmation alert at dispatch time.	PTA determines time needed for NEMT to reach pickup location. As part of the notification, availability of Car Seat is confirmed (if requested by the Prenatal Traveler).
	Prenatal Traveler	2	Traveler confirms pickup at time required for NEMT to be dispatched.	
	PTA	3	Prior to driver arrival, the PTA dispatches the vehicle, sends trip and driver info along with the location of the vehicle (updated in real-time) to Prenatal Traveler.	Prenatal Traveler opens the PTA on her phone to see the driver location on a map. Only trained drivers are assigned.

Use Case	Prenatal Traveler Takes a Trip			
	Prenatal Traveler	4	Prenatal Traveler tracks the location of the vehicles.	Location could be tracked either in the app or the webpage.
	PTA	5	On arrival, the PTA sends notification to the Prenatal Traveler.	NEMT Mobility Provider and the Prenatal Traveler will also have an option to communicate with each other based on her user preferences.
	Prenatal Traveler	6a	On notice of driver arrival, Prenatal Traveler confirms the trip and driver information prior to getting into the vehicle.	
	NEMT Mobility Provider	6b	If the Prenatal Traveler doesn't come to the vehicle within certain time, NEMT mobility provider identifies the trip as a "No-Show".	NEMT Mobility Provider's interface will have a "No-Show" option.
	Prenatal Traveler	7a	Prenatal Traveler continues the trip.	
	PTA	7b	The PTA notifies Medical Office that the Prenatal Traveler didn't take the trip.	
	PTA	8a	If the PTA determines that the Prenatal Traveler will miss the appointment (due to traffic or other reasons), it notifies the Medical Office about the trip delay.	
	Medical Offices	8b	Medical Office contacts the Prenatal Traveler to confirm that the Prenatal Traveler is still on schedule for the appointment.	
	Prenatal Traveler	9a	Prenatal Traveler completes the trip and attends the appointment.	
	Prenatal Traveler	9b	Prenatal Traveler finds another ride or cancels appointment and therefore no longer needs the NEMT trip.	

Use Case	Prenatal Traveler Takes a Trip			
	Prenatal Traveler	10a	Following the appointment, Prenatal Traveler schedules a trip for return pickup. Prenatal Traveler stops by the pharmacy to pick up the medicine on the way back home.	Prenatal Traveler doesn't depend on Medical Office's staff or phone to schedule trips for their patients. Prenatal Traveler will be picked up within reasonable time after the appointment so that she won't wait at the doctor's office.
	Prenatal Traveler	10b	Prenatal Traveler attends or reschedules appointment.	
	PTA	11	Prenatal Traveler takes return trip. (On-demand return trip commences at steps 3 to 6 above)	
	Prenatal Traveler	12	Prenatal Traveler completes the return trip.	
	PTA	13	PTA shares the trip information with the Operating System.	
Post-Conditions	Prenatal traveler completes the trip			
Policies and Business Rules	N/A			
User Needs Traceability	PTA-UN001-v01 Personal Devices PTA-UN003-v01 Graphic User Interface (GUI) (Transaction Equipment) PTA-UN004-v01 Delay of Arrival or Cancellation of Trip Request PTA-UN005-v01 Timely Return Pickup PTA-UN006-v01 Vehicle and Driver Description PTA-UN007-v01 Prenatal Traveler Notifications PTA-UN012-v01 Delay/Cancelation Notification PTA-UN019-v01 Car Seat PTA-UN022-v01 Trip Data PTA-UN023-v01 Driver and Vehicle Info PTA-UN025-v01 Medical Office Integration PTA-UN039-v01 Driving Training PTA-UN041-v01 Driver Routing PTA-UN042-v01 Driver Communication and Preference PTA-UN043-v01 Driver Situation PTA-UN044-v01 Medical Office Notification			
Inputs Summary	N/A			

Use Case	Prenatal Traveler Takes a Trip
Output Summary	N/A

Source: City of Columbus



Source: City of Columbus

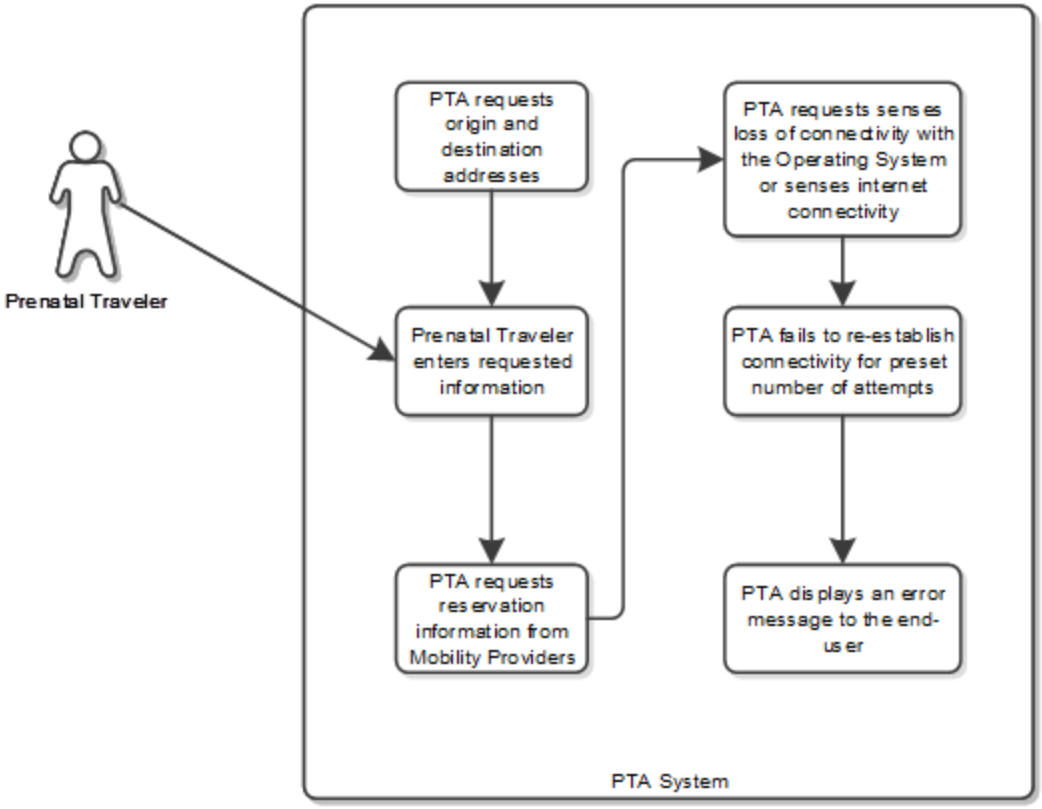
Figure 18: UC4-S1: Users Connect to the Operating System for Data

Table 18: UC4-S1: Users Connect to the Operating System for Data

Use Case	Users Connect to the Operating System for Data	
Scenario ID and Title	UC4-S1: Users Connect to the Operating System for Data	
Scenario Objective	City of Columbus and third-party users connect to the Operating System to receive data	
Operational Event(s)	View reports, configures reports, accesses data through APIs	
Actor(s)	Actor	Role
	PTA	Responsible for creating the data
	Operating System	Responsible for collecting and preparing data to support analytics and performance measures by the City of Columbus and third parties
	City of Columbus	Members of the City with unrestricted access to data for reporting and analytics purposes

Use Case	Users Connect to the Operating System for Data			
	Third-Party Users	Members of the public with restricted access to data for development purposes		
Pre-Conditions	City of Columbus and Third-Party Users have access to the Operating System data			
Key Actions and Flow of Events	Actor	Step	Key Action	Comments
	PTA	1	PTA creates data by providing multimodal trip planning and payment services to Travelers.	
	Operating System	2	The Operating System collects the data that is generated by the PTA and prepares it for analytics.	Access to third party and the City will be based on their data access rights. Data is shared with ODM, CelebrateOne, MCO. Data will be based on open standards.
	City of Columbus	3	City of Columbus users access the data through web-based dashboards which display performance metrics. City users can configure the reports that are available on the dashboards.	
	Third-party users	4	Third-party users access the data through an application interface, which are developed by the Operating System team.	
Post-Conditions	Third-party users and the City access the data.			
Policies and Business Rules	Data does not include PII			
User Needs Traceability	PTA-UN019-v01 Open Standards PTA-UN022-v01 Trip Data PTA-UN027-v01 Access to Data PTA-UN028-v01 Open API for Data Transfer PTA-UN030-v01 ODM Data Access PTA-UN031-v01 MCO Data Needs PTA-UN038-v01 CelebrateOne Data			
Inputs Summary	N/A			
Output Summary	Data for development and reporting/analytics			

Source: City of Columbus



Source: City of Columbus

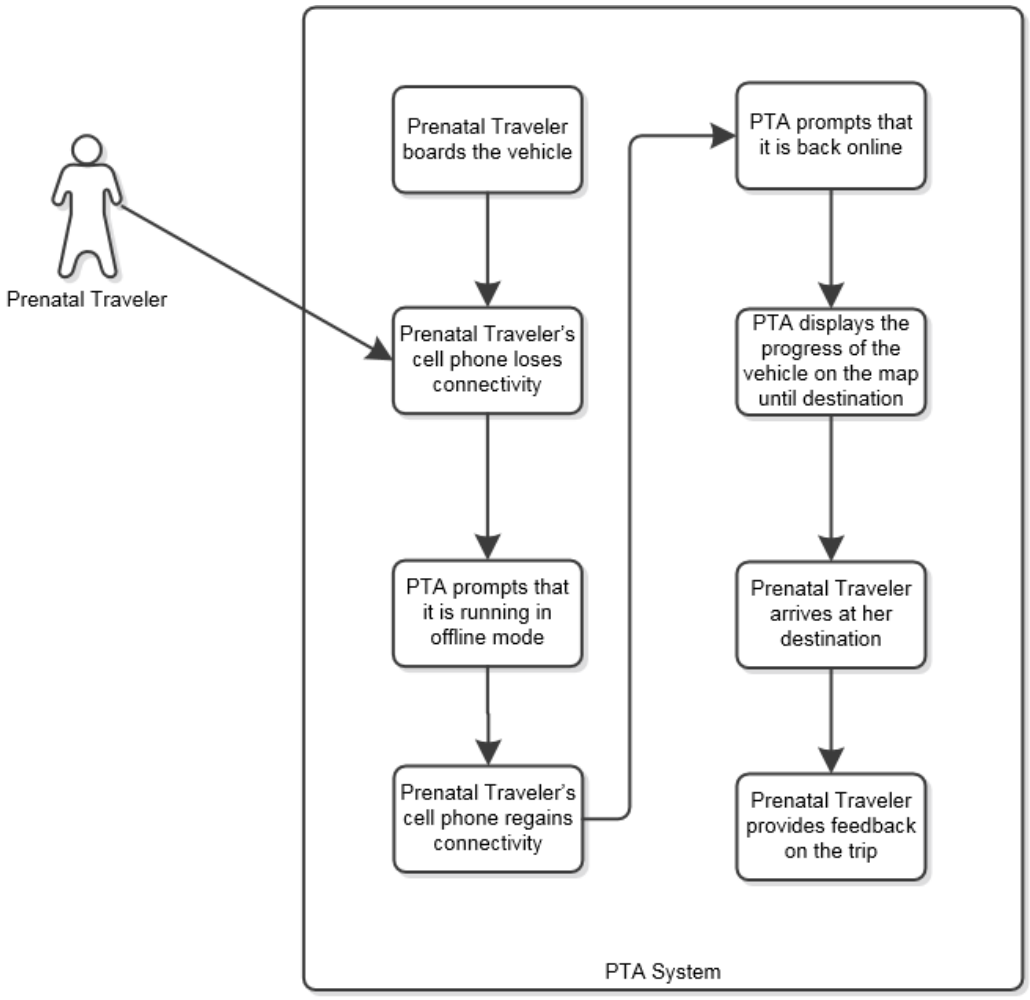
Figure 19: UC5-S1: Failure Condition – Loss of Communications with the Operating System

Table 19: UC5-S1: Failure Condition – Loss of Communications with the Operating System

Use Case	**Failure Condition – Loss of Communications with the Operating System**	
Scenario ID and Title	UC5-S1: Failure Condition – Loss of Communications with the Operating System	
Scenario Objective	Prenatal Traveler wishes to schedule trip using NEMT services	
Operational Event(s)	Loss of connectivity	
Actor(s)	Actor	Role
	Prenatal Traveler	End- user of the system
	PTA	Application (PTA could be an app in the smartphone, webpage portal). This scenario is not applicable for call center users.
	Mobility Providers	Provides transport services
Pre-Conditions	PTA system has agreements in place with participating NEMT Mobility Providers Prenatal Traveler owns a smartphone	

Use Case	Failure Condition – Loss of Communications with the Operating System			
	Prenatal Traveler's smartphone has internet access and knows its location [has global positioning system (GPS) capabilities] Prenatal Traveler has downloaded the PTA to their smartphone and accepted the PTA Terms and Conditions			
Key Actions and Flow of Events	Actor	Step	Key Action	Comments
	PTA	1	The PTA requests origin and destination addresses from the end user.	
	Prenatal Traveler	2	Prenatal Traveler enters origin and destination addresses in response to PTA prompt.	
	PTA	3	The PTA requests reservation information from Mobility Providers.	
	PTA	4a	The PTA senses loss of connectivity with the Operating System.	
		4b	The PTA senses loss of internet connectivity.	
	PTA	5	The PTA tries to re-establish connectivity for a preset number of attempts or time period.	
	PTA	6	The PTA displays an error message to the end user indicating loss of communication connectivity. The PTA requests the user to use the call-in number.	The error message is a default message displayed by the PTA.
	PTA	7	The PTA displays a message to the end user indicating the error has been reported.	The error message is a default message displayed by the PTA.
Post-Conditions	Prenatal Traveler is unable to use the PTA.			
Policies and Business Rules	N/A			
User Needs Traceability	PTA-UN001-v01 Personal Devices PTA-UN016-v01 Offline Usage			
Inputs Summary	Prenatal Traveler provides origin and destination information			
Output Summary	PTA provides error message to user			

Source: City of Columbus



Source: City of Columbus

Figure 20: UC5-S2: Failure Condition – Temporary Loss of Communications

Table 20: UC5-S2: Failure Condition – Temporary Loss of Communications

Use Case	**Failure Condition – Loss of Communications**	
Scenario ID and Title	UC5-S2: Failure Condition – Temporary Loss of Communications	
Scenario Objective	Prenatal Traveler experiences temporary loss of connectivity on smartphone while on route to destination	
Operational Event(s)	Temporary loss of communications	
Actor(s)	Actor	Role
	Prenatal Traveler	End user of the system

Use Case	Failure Condition – Loss of Communications			
	PTA	Application (PTA could be an app or a webpage in the smartphone). This scenario is not applicable for call center users.		
	Operating System	Trip optimization		
Pre-Conditions	Prenatal Traveler has downloaded the app on the smartphone Prenatal Traveler has internet on the smartphone			
Key Actions and Flow of Events	Actor	Step	Key Action	Comments
	Prenatal Traveler	1	The Prenatal Traveler boards the vehicle.	
	PTA	2	The Prenatal Traveler's cell phone suddenly loses network connectivity and the PTA prompts that it is running in offline mode.	
	PTA	3	The Prenatal Traveler's cell phone suddenly regains its network connectivity. The PTA prompts the Prenatal Traveler that it is back online.	Trip details that were stored in the PTA while offline are transmitted to the Operating System.
	PTA	4	The PTA displays the progress of the vehicle on a map until the Prenatal Traveler reaches her destination.	
	Operating System	5	The trip details are stored in the Operating System.	
	Prenatal Traveler	6	The Prenatal Traveler exits the vehicle and arrives safely at her destination. The Prenatal Traveler clicks a link in the PTA to provide positive feedback.	
Post-Conditions	Prenatal Traveler completes the trip			
Policies and Business Rules	N/A			
User Needs Traceability	PTA-UN001-v01 Personal Devices PTA-UN003-v01 Graphic User Interface (GUI) (Transaction Equipment) PTA-UN015-v01 Feedback PTA-UN016-v01 Offline Usage			
Inputs Summary	N/A			
Output Summary	N/A			

Source: City of Columbus.

Chapter 7. Summary of Impacts

This section describes the anticipated operational and organizational impacts of the proposed system on the City during all stages of the proposed system, from development through implementation, support, and maintenance of the proposed system.

7.1. OPERATIONAL IMPACTS

Changes in procedure regarding support and maintenance of the new system are anticipated, however, the solution will dictate the extent of additional support needed. Considerations include business owner(s), software development and database resources in a primary and backup capacity, server, and security concerns. Data Privacy and Data Management plans will be identified and refined during development to address operational impacts and changes in data retention requirements. This will likely fall under departmental owner data retention requirements or new requirements will be made since new services are being offered. If usage reports or historical information are identified as a requirement, retention policies will need to be reviewed and changed as needed.

Most of the PTA project will exist outside of the City's purview. Operational impacts for the MCOs will be necessary. MCOs will need to create a new category in their member database so that the PTA pilot participants can have their profiles moved to this new category to ensure their information, benefits and communications are shared with the pilot technology vendor/TB and NEMT Mobility Providers.

The PTA system impacts would be focused on ensuring contracts are let with enough NEMT Mobility Providers to fulfill the pilot needs. As well, there will have to be training for any organization (MCOs, NEMT Mobility Providers) new to their technology and processes.

NEMT Mobility Providers under contract with the technology vendor/TB will also need training and access to the new technology software. It is anticipated that the solution provider will provide a cloud-based solution that doesn't require physical hardware. This may or may not result in a need for additional hardware, i.e. computers, servers, in-vehicle devices.

It is anticipated that Medical Providers will receive alerts via email. Medical offices may need training and access to technology software if something beyond their business email provider is necessary. If the pilot includes email communication only to the medical offices and not a web portal, it is unlikely that there will be a need for additional hardware.

7.2. ORGANIZATIONAL IMPACTS

Once a vendor and/or systems integrator is selected, it is anticipated to result in added responsibilities for the City of Columbus. An intradepartmental Memorandum of Understanding (MOU) will be established to define responsibilities. This agreement will at a minimum define staffing levels and positions, funding responsibilities, define responsibilities for each department and organization point of contact and decision-maker.

The Operating System will be operated by the Smart Columbus PMO. The PMO will continually monitor the operational performance and consider adjustments to the system to ensure it is operating as expected. Further, the City will work with the Independent Evaluator to provide requested data. Other organizational impacts are expected for the MCOs and technology vendor/TB. The MCOs will continue their relationship with the existing TB to fulfill all non-PTA NEMT services. The PTA system will act like a broker which could impact future relationships with TBs.

7.3. IMPACTS DURING DEVELOPMENT

There are several projects and coordination tasks that could affect the ability of the system to provide all the services that have been conceptualized for it. ODM can change its rules and processes as it applies to both the MCOs and the counties and their delivery of NEMT services. The State of Ohio Infant Mortality Task Force is looking at changes it can make which could impact transportation for Prenatal Travelers. CelebrateOne continues to affect change by working on pilots that impact Prenatal Travelers. COTA's C-pass may have an impact on working Medicaid members. C-pass is a free bus pass for employees who work in a selected downtown area. This pass can be used every day for any route and therefore could be used for NEMT trips without the MCO being notified.

Data collection and coordination with the five (two for the pilot and the other three for data sharing) MCOs could prove challenging and will have to be handled through data sharing agreements and MOUs. The PTA system vendor will begin with its own existing NEMT relationship. The ability to collect trip information within the Operating System is a required component of the PTA – these interfaces will need to be developed, and the parameters and expectations for integration defined through agile development processes.

Chapter 8. Analysis of Prenatal Trip Assistance

An analysis of the PTA is summarized below under Summary of Improvements.

8.1. SUMMARY OF IMPROVEMENTS

Table 21: Summary of Improvements provides a summary of improvements that result from the proposed system.

Table 21: Summary of Improvements

Improvements	Summary
New Capabilities	• A website and smartphone application for scheduling NEMT trips • Additional notifications of the upcoming NEMT trip with driver and vehicle information • Access to on-demand NEMT services • An email to Medical Offices to notify them of the Prenatal Traveler's missed pickup, cancellation or delay in traffic • Reliable feedback collection • Integration with the Operating System for and access to data
Enhanced Capabilities	MCOs and PTA system can track NEMT Mobility Providers real-time
Deleted Capabilities	No capabilities deleted
Improved Performance	• Improved mobility for Prenatal Travelers • Improved data for City of Columbus, ODM, MCOs and third-party users

Source: City of Columbus

8.2. DISADVANTAGES AND LIMITATIONS

The constraints in **Chapter 5. Concept for the New System** under Operational Policies and Constraints may be considered disadvantages of the proposed system in terms of needing to be overcome to achieve the goals and objectives for the PTA.

8.3. ALTERNATIVES AND TRADE-OFFS CONSIDERED

The main alternatives considered for PTA were the lead partner for the pilot. Given ODM's role in overseeing Medicaid in Ohio, it was the first choice as a partner. As the City researched ODM's role as it related to NEMT service delivery, it was clear that its impact was more on policy than delivery of services; its main NEMT service delivery was through the counties. The City reached out to Franklin County next to understand its role and whether the County would be a good partner. As discussed previously, Franklin County does deliver NEMT services for pregnant women under a program called PRS. The County program numbers were so small that any pilot based on its numbers would not have been a good gauge of the impact of the new system. Therefore, the MCOs were chosen as the best partner for this project.

Table 22: Alternatives and Trade-Offs Considered

Trade-Offs/Alternatives	Description	Decision	Rationale
ODM as Lead Partner	ODM was the first choice for partnership with this pilot as it leads the implementation and operation of the Medicaid program in Ohio.	Do not pursue	MCOs are direct providers of the NEMT services. ODM is also considering major changes to NEMT delivery.
FCDJFS as Partner	Add FCDJFS as a partner for the PTA program due to its PRS NEMT delivery service.	Do not pursue	FCDJFS does not provide enough prenatal NEMT services to conduct or add to a pilot.
Higher Level Integration with Medical Offices	Create a web portal interface for each medical office that is treating a pilot participant. This interface would connect to the medical office's scheduling and records system.	Do not pursue	This is not feasible due to the number of medical offices that could be involved, timeline and the costs of connecting to various systems.

Source: City of Columbus

Chapter 9. Notes

There are no applicable notes for the proposed system.

Appendix A. Stakeholder Engagement Summary

This summary of end user and stakeholder engagement activities assessed the current environment and challenges Prenatal Travelers, in eight CelebrateOne neighborhoods, face when scheduling non-emergency medical transportation (NEMT) for medical visits during pregnancy.

End users and stakeholders involved in the engagement process included:

- Expectant moms, new moms – Linden residents, Moms2B
- Physicians caring for expecting moms – Primary One, Ohio State University Wexner Medical Center (OSU), Mount Carmel
- Managed Care Providers (MCPs) – CareSource, Buckeye Health, Molina, United Healthcare, Paramount Advantage
- NEMT providers – Taxi company and TBs: Veyo, Circulation, Kaizen Health), Lyft, Uber, Access 2 Care, MAS Ohio, Yellow Cab
- County/State agencies –FCDJFS, ODM, ODOT, MORPC
- Transit providers – Dayton RTA, Central Ohio Transit Authority (COTA)
- Social support groups – CelebrateOne

1. Event: Sidewalk Labs/Linden Focus Groups Research
    a. When: June – August 2017
    b. Where: Grace Baptist Church and phone interviews
    c. Who participated: Prenatal Travelers, new moms, CelebrateOne, OSU, Mount Carmel, Kaizen Health, Lyft, Uber, Veyo, ODM, Paramount Advantage, Access 2 Care, CareSource
    d. Why: To discover how improved mobility via Smart Columbus can be a strategy to reducing high infant mortality rates by learning transportation pain points, challenges and desires of expectant and new moms.
    e. Key Takeaways:
        i. Accommodations for strollers, car seats, wheelchairs and walkers need to be part of the approach.
        ii. Smartphones and data plans are prevalent in this community
        iii. Convenience and cost influence which mode when there's no car access.
            1) Transit takes 2 hours to get to appt; waiting 3 hours for a ride home isn't practical.
            2) Drivers honk once and leave.
            3) Driver wouldn't stop for RX on way home from the doctor.
            4) Cabs and Uber are better suited for car seats and direct routing to a destination, but cost is a concern.
            5) English-only language is barrier for some.
        i. The project will need to have an important education component for successful adoption.

ii. Healthcare providers: 30-50 percent no-show rates, half may be transport related, patients' addresses change so bookings outdated, stretched too thin to provide patient transport assistance

The following is a summary of end user and stakeholder engagement activities to assess community interest in utilizing an online/mobile app for multimodal trip planning and payment but is relevant to PTA. While the audiences did not consist solely of Prenatal Travelers, the target location of Linden is one of the eight CelebrateOne neighborhoods and some of those surveyed were pregnant moms.

End users and stakeholders involved in the MMTPA/CPS engagement process included:

- Expecting moms
- Older adults
- Linden residents
- People who work in Linden
- Bicyclists
- Pedestrians

A.1 END-USER ENGAGEMENT EVENTS SUMMARY

1. Event 1: Smart Columbus Focus Groups
    a. When: June 21, 2017
    b. Where: St. Stephens Community House, Linden
    c. Who participated: 10 Low-income individuals who are part of Moms2B program
    d. Why: To learn about the pain points, challenges, and desires of the target beneficiaries (expectant and new moms)
    e. Key takeaways
        i. NEMT services arrive late, forcing people to miss appointments – appointments can get rescheduled to all the way at the end of the day.
        ii. Bus delays can cause transfers to time out.
        iii. 8/10 members had smartphones, some with sufficient data plans, and were very comfortable with using theme in general
        iv. Around 50 percent of the focus group members did not have credit cards
        v. Many did not know how reliable Uber/Lyft was and so were therefore less comfortable using them
        vi. Despite lower socioeconomic profile, participants would be willing to pay a premium because of importance of doctor's appointments and significant discomfort of riding bus
        vii. People are willing to pay a premium for speed, but distrust giving out credit card info, more comfortable with debit card, which is how they currently shop online
2. Event 4: Linden Moms2Be Focus Group
    a. When: June 21, 2017
    b. Where: Grace Baptist Church, Linden

c. Who participated: 11 female community members (expecting and new moms) volunteered to attend

d. Why: Focus group of community volunteers to gain additional, more directed insight on specific user needs

e. Key takeaways:

   i. The large majority of participants had smartphones and access to Wi-Fi/data. None of the participants pay for apps.

   ii. There is concern with putting bank/credit card information into an app because of security concerns. The preference is to have a prepaid card to put into the app for payment of transportation services.

   iii. The ability to both plan the trip in the app and also pay for it in the app was attractive to most participants

A.2 LINDEN COMMUNITY OUTREACH FOR THE MULTIMODAL TRIP PLANNING APPLICATION/COMMON PAYMENT SYSTEM PROJECT

While the below outreach was not specifically conducted for the PTA project, the MMTPA/CPS outreach did contain questions and answers that help make decisions for the PTA project. Here is an excerpt of the outreach with specific questions focusing on smartphone availability and how these residents of the Linden neighborhood (one of the eight CelebrateOne neighborhoods) like to receive information. Only select questions are noted below.

A.2.1 Survey Results

The following are the results of survey questions posed to residents in Linden about transportation services in general. These questions were meant to identify current patterns of transportation usage and obstacles preventing transportation usage in accordance with ideal outcomes envisioned by the residents. While these questions do not directly address the goals of the PTA project, they were meant to uncover gaps in the current condition that could possibly be overcome when considering design of the PTA.

Of the 68 total surveys collected, 14 participants (21 percent) did not provide an answer to any of the eight questions on the Smart Apps survey. It should be noted that some participants gave more than one response to a question and not every participant answered each question. All percentages are calculated with a denominator of the sum of the number of individual responses received for that question, so percentages equal to 100 percent.

SURVEY QUESTION 2: How do you currently get information about these services if you use them today?

Of the 65 individual responses, most get their information from the internet/website (29 percent), smartphone/apps (15 percent), and Google Maps (15 percent).

Table 23: How do you currently get information about these services if you use them today?

Preference	Number of Responses	% of Respondents
Internet/website	19	28%
Smartphone/apps	10	15%
Google Maps	10	15%
COTA schedules	5	7%
Others	4	6%
Call information	4	6%
Social service agency	3	4%
Other	3	4%
COTA info center	2	3%
Public meetings	2	3%
Email	2	3%
Columbus biking page	1	1%

Source: City of Columbus

SURVEY QUESTION 3: How would you like to get information?

Of the 72 individual responses, most residents would like to get their information from a phone/app (50 percent), or a kiosk (24 percent).

Table 24: How would you like to get information?

Preference	Number of Responses	% of Respondents
Phone/app	36	53%
Kiosk	17	25%
Text alerts	6	9%
Paper version	5	7%
Signage	5	7%
Information center	2	3%
Other	1	1%

Source: City of Columbus

SURVEY QUESTION 5: What are the obstacles to getting all the information in one place?

Of the 38 individual responses, most participants mentioned that a lack of Wi-Fi access (32 percent), kiosks/information centers (16 percent), and inter-business cooperation are the highest obstacles.

As previously mentioned, internet connectivity will be a prerequisite for using the MMTPA. Other Smart Columbus projects such as Mobility Hubs and Smart Street Lighting are meant to partially alleviate the lack of internet connectivity reported by residents.

Table 25: What are the obstacles to getting all the information in one place?

Obstacles	Number of Responses	% of Respondents
Wi-Fi access	12	18%
No kiosks/physical info centers	6	9%
Lack on inter-company cooperation	6	9%
Fees	5	7%
Lack of multi-lingual options	3	4%
No smartphone	3	4%
Not enough options	2	3%
No app	1	1%

Source: City of Columbus

SURVEY QUESTION 9: What are the obstacles?

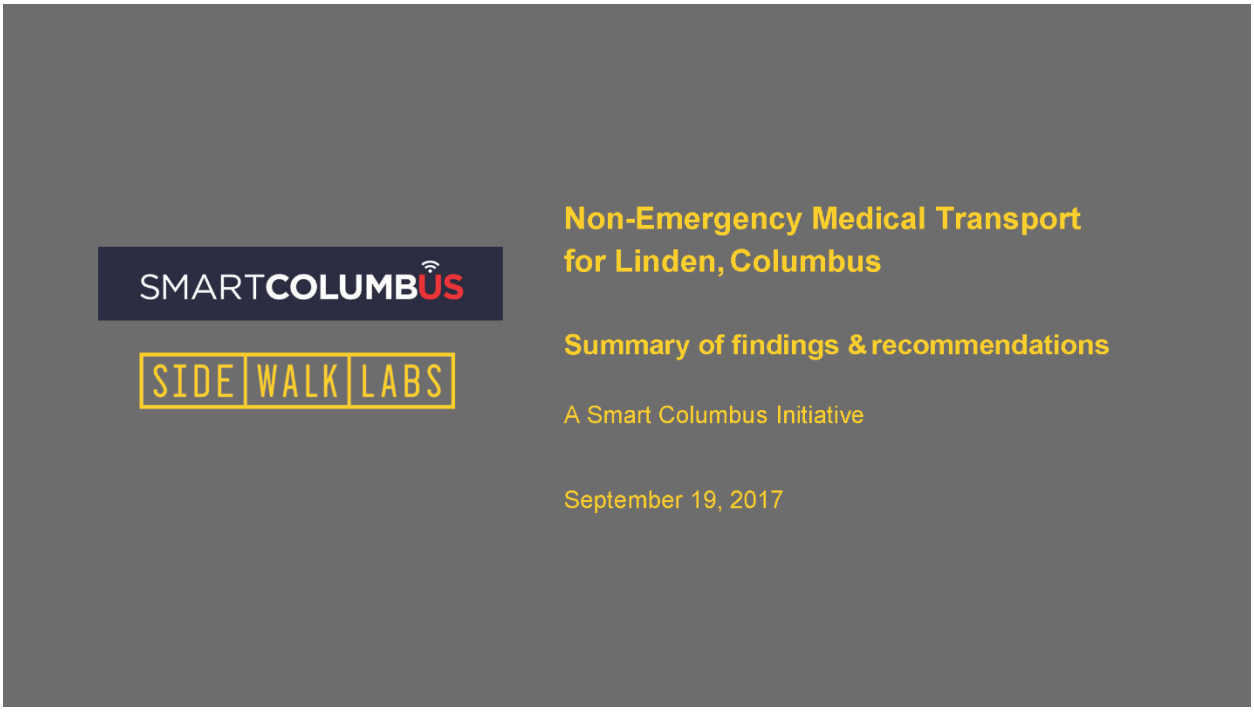
Of the 12 responses received, obstacles include the lack of a common payment method (5 responses), lack of discounts (2 responses), lack of Wi-Fi (2 responses), education (2 responses), and lack of a loan program (1 response).

Table 26: What are the obstacles?

Obstacles	Number of Respondents	% of Respondents
Lack of common payment method	5	7%
Lack of discounts	2	3%
Wi-Fi	2	3%
Education	2	3%
Lack of loan programs	1	1%

Source: City of Columbus

Appendix B. Sidewalk Labs' Non-Emergency Medical Transportation Survey Summary



Executive Summary

- NEMT involves **coordination of three key user groups** – patients, healthcare providers, and NEMT service providers (brokers & drivers);
- The **complexity creates multiple opportunities for system failure**, felt most acutely by the patients, but the status quo is also sub-optimal for healthcare providers and NEMT brokers;
- Innovation opportunity lies primarily in **changing service delivery model:** added focus on **user experience**, leveraging **additional supply**, and utilization of **real-time monitoring features**;
- **2 existing implementation models of innovation:** A) technology licensing; B) full-stack tech brokerage. Both can support the necessary features and capabilities, though Model B offers a more "white glove" experience;
- Next steps: choose innovation model first, then bring on innovation partners (tech vendor, managed care plan, and hospital/clinic) to devise pilot plan

1

Overview

- Executive Summary
- Sidewalk Labs – Smart Columbus collaboration overview
- Problem diagnosis & opportunities for innovation
- Capabilities & features – wish list vs. vendor offerings
- Innovation models
- Further considerations & next steps

2

Sidewalk Labs – Smart Columbus collaboration

Objectives

- Assess current pain points and underlying causes for Linden moms and infants in accessing healthcare services
- Provide Smart Columbus with insights and tools to implement a pilot program for non-emergency medical transportation (NEMT)

Deliverables

- A summary of existing NEMT demands and options, stakeholder pain points
- A recommended set of strategy, program design, and necessary technical capabilities of the NEMT solution, for Linden
- A recommended pilot implementation strategy

Presentations & demo during one of our trips to Columbus (July 2017)

3

Problem diagnosis / Opportunities of innovation

4

Strong frustrations heard from patients and care providers

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Healthcare Providers

- Our appointment no-show rates: ~30-50%; half of which may be transport related
- Patients' addresses often change, so it's hard to ensure booking is up to date
- We are stretched too thin to provide much transportation assistance to patients

Patients

- Taking transit isn't really an option, it takes 2 hours to get to an appointment
- I waited 3 hours for my ride home, while my child was at home alone.
- If I bring my other kids with me, I need car seats
- Sometimes the driver will just honk once and then leave
- I wanted to stop by Kroger to pick up my meds on the way home, but driver wouldn't do it. I had to go home, call for another ride for 2 days later.

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Current NEMT access model

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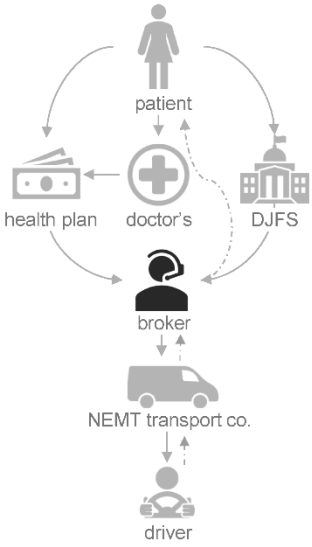
Patient calls their health plan or Franklin County DJFS, or

Patient calls doctor's office (which may have the resources to call the health plan)

Health plan / DJFS calls NEMT broker

Broker finds an NEMT transport company with available taxi / van

Transport company dispatches ride to and communicates with patient.



6

Anatomy of current pain points

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Industry issues	Provider issues	User Pain Points
Fragmentation Inadequate technology Complex processes	Lack of direct, user-centric interfaces	• Patient unfamiliar with entitled benefits, number to call, or English proficiency to navigate the request process • Doctor's office too short-staffed to call broker on patient's behalf
	Lack of monitoring tools / accountability	• Brokers & transportation companies do not rectify service shortfalls • Fraud & misuse à High cost of subsidy
	Limited vehicle availability and flexibility	• Must book in advance • Long wait time • Drivers sometimes don't show up

7

Three key innovation opportunities

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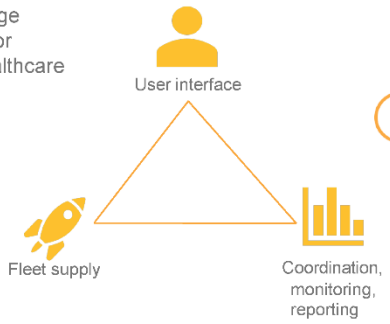
1. Request, access, and manage NEMT benefits effortlessly for NEMT patients and their healthcare providers



2. Offloads logistical burdens from healthcare & transportation providers
   - Active, real-time monitors and rectifies service shortfalls
   - Provides analytics on usage, cost, & health outcomes

3. Leverages additional & more flexible vehicle supply

8

The ideal experience

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An intuitive experience
- Easy to request rides
- Provides assuring information to patients
- Does not require high-tech to access benefits

A reliable ride
- Minimal wait time
- Shows up promptly
- Assures sense of safety

An effective system
- Cost efficient
- Track outcomes
- Prevents fraud & misuse

9

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Capabilities & features wish list vs. vendor offerings

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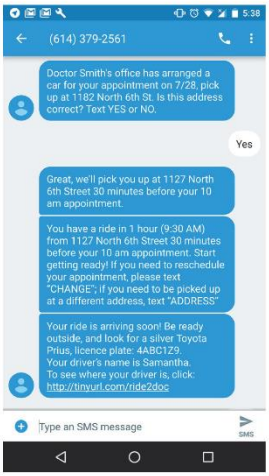
We conducted user testing with local moms

User testing with moms @ Mom2B meeting



Testers evaluated the SMS-based NEMT experience

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Program design features – for patients

	Request	Pick-Up	Ride
"Must Haves"	Full functionality that does not require a smartphone Ability to modify pick-up location up to 24 hours before appointment	Pick-up tailored to appointment time, no excessive wait time Description of vehicle & driver, notice of driver arrival 5-minute wait at pick-up before driver declares "no-show"	
"Nice-to-Haves"	Allow for intermediary stops (e.g. pharmacy)	Privacy compliant way for driver to contact patient in case of no-show	Browser-based map with tracker and ride ETA

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Program design features – healthcare providers & health plans

	Request	Pick-Up	Ride
"Must Haves"	Automatic health insurance eligibility verification		Monitoring and alerts for healthcare provider to prevent fraud / abuse
"Nice-to-Haves"	Call center support Integration with appointment booking software	Alerts to healthcare provider if patient does not show up at pick-up location	

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Circulation's, Veyo's, & Kaizen's current NEMT offerings support most must-have capabilities

● Well-enabled ◐ Partially enabled ○ Limited

	Lyft	Circulation	Veyo	Kaizen
Full functionality that does not require a smartphone	●	●	●	●
Access to numerous, flexible vehicle supply to reduce wait time & unreliability	●	●	◐	●
Offloads burdens from healthcare administrators (e.g. call center, insurance verification)	◐	●	●	●
Ability for patient to modify pick-up location up to 24 hours before appointment	◐	◐	●	●
Description of vehicle and notice of driver arrival in advance	●	●	●	●
5-minute wait time at pick-up location before declaring "no-show"	●	●	●	●
Monitoring and alerts to healthcare provider and health plan to prevent fraud / abuse	○	◐	●	●

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Similarly for "nice to have" features

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Well-enabled Partially enabled Limited

	Lyft	Circulation	Veyo	Kaizen
Accommodates intermediary stop (e.g. pharmacy stop on way from doctor's)	○	●	●	●
Call center for patient support	○	●	●	●
Phone call/text from driver to patient, if	●	●	●	● patient not at pick-up location
Browser-based map with tracker and ride	●	●	●	● ETA

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Innovation models & discussion

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Innovation partnership archetype

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A – Technology licensing

Technology companies license technology and/or new fleet supply to traditional NEMT brokers, which remains the coordinator of ride requests & providers

E.g. LogistiCare in process of integrating **Lyft**'s supply into its dispatch system, in 276 US cities

B – Full-stack brokerage

Tech-integrated brokers manage the entirety of a health plan's transportation benefit, user experience, and new fleet supply

E.g. Veyo administers Idaho's state-wide NEMT brokerage contract

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Innovation partnership archetype

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A – Technology licensing

Pros:
- Enhanced service flexibility (enables on-demand dispatch)
- Cost efficiency
- Ease of implementation

Cons:
- Does not address user pain in requesting service
- Insufficient support for healthcare providers
- Relies on the NEMT brokers to make the change

B – Full-stack brokerage

Pros:
- Increased service efficiency & flexibility
- Cost efficiency
- Improved user experiences
- Faster resolution in case of service shortfalls à more seamless user experience
- Better management of resources due to monitoring/analytics support

Cons:
- Institutional commitment and investment in systems integration

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Integration & customer support handled by externally, in either model

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	Model A	Model B
Communication with Patient		
➢ **Routine communications (via SMS / call center)**	Handled by NEMT broker partner	Vendor offering
➢ **Assistant / troubleshooting**	Handled by NEMT broker partner	Vendor offering
Benefit eligibility verification	Relies on HCPs / NEMT brokers	Handled by vendor
Training for healthcare administrators	N/A	Provided by tech vendor
Ongoing system maintenance	Provided by tech vendor	Provided by tech vendor

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Integration Considerations (as of 9/19/17)

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● Well-enabled ◐ Partially enabled ○ Limited

	Lyft	Circulation	Veyo	Kaizen
Integration with appointment scheduling system	N/A	N/A	In development	
Communication with Patient				
➢ Routine communications (via SMS / call center)	Handled by NEMT broker partner	●	●	●
➢ Assistant / troubleshooting	Handled by NEMT broker partner	●	●	●
Benefit eligibility verification	Relies on HCPs / NEMT brokers	Handled by NEMT partner	● ● broker	
Training for healthcare administrators	N/A	N/A	●	●
Ongoing system maintenance	●	●	●	●

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Next steps

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Next Steps on Road to Pilot

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Action Item	Description	Key Considerations
1 Select innovation model	Choice of innovation archetype will drive partner selection & pilot implementation decisions	• Full-stack model preferred in the July 26 key stakeholders meeting • Ohio Statewide NEMT Reform (starting July 2018)
2 Discuss with shortlist tech vendors, identify partner	Co-develop pilot plans with the selected tech partner	• See deliverable for assessment of companies' capabilities
3 Identify hospital/ clinic partner	Tech system integration and updates in administrator work flow	• Executive buy-in from critical to overall success • Shortlisted NEMT tech companies all experienced in working with healthcare partners
4 Partner with managed care plan(s)	For funding of the NEMT services, and to enable seamless eligibility verification	• Managed care plans already working with several innovation partners, which can expedite partnership and integration

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Open Questions

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	Question	Early Hypotheses
Metrics for Success	How will success be defined for a pilot?	Success to be measured primarily by a reduction in transportation-related no show rate
Car Seat Availability	Should car seats be mandated?	While Ohio law waives car-seat requirement for for-hire ride services, the lack of car-seats in vehicles is currently a pain point for many moms. Require a % of vehicle fleet to be equipped with car-seats, and consider charging a small surcharge going towards the drivers
Common Payment System	Should NEMT program design be anchored to Common Payment System integration?	Deprioritize until after Common Payment System and NEMT systems independently operational

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Appendix C. Acronyms and Definitions

Table 27: Acronym List contains project specific acronyms used throughout this document.

Table 27: Acronym List

Acronym/Abbreviation	Definition
API	Application Programming Interface
CFR	Code of Federal Regulations
CIS	Center for Internet Security
COTA	Central Ohio Transit Authority
ConOps	Concept of Operations
CPS	Common Payment System
DSRC	Dedicated Short Range Communications
FCDJFS	Franklin County Department of Job and Family Services
FHWA	Federal Highway Administration
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
GTFS	General Transit Feed Specification
GTFS-RT	General Transit Feed Specification – Real-Time
GUI	Graphical User Interface
IEEE	Institute of Electrical and Electronics Engineers
ITS	Intelligent Transportation Systems
MCO	Managed Care Organization
MCOP	MyCare Ohio Plans
MMTPA	Multimodal Trip Planning Application
MORPC	Mid-Ohio Regional Planning Commission
NEMT	Non-Emergency Medical Transportation
NET	Non-Emergency Transportation
ODM	Ohio Department of Medicaid
ODOT	Ohio Department of Transportation
OSU	The Ohio State University
OWASP	Open Web Application Security Project
PII	Personally Identifiable Information

Acronym/Abbreviation	Definition
PRS	Pregnancy Related Services
PTA	Prenatal Trip Assistance
RFP	Request for Proposal
RFQ	Request for Quote
SC	Smart Columbus
SCC	Smart City Challenge
SCMS	Security Credential Management System
SEMP	Systems Engineering Management Plan
SoS	System of Systems
TB	Transportation Broker
TNC	Transportation Network Company
USDOT	United States Department of Transportation

Source: City of Columbus

Appendix D. Glossary

Table 28: Glossary contains project specific terms used throughout this document.

Table 28: Glossary

Term	Definition
Agile	A method of project management that is characterized by the division of tasks into short phases of work and frequent reassessment and adaptation of plans
App	Software application
Application solution providers	Private companies that design, test, integrate, operate, and maintain one or more aspects of the CPS
CelebrateOne	A City of Columbus and Franklin County initiative to fight infant mortality and racial disparity
Data privacy	The reasonable expectation that data of a sensitive nature will be kept confidential, sanitized and/or encrypted, and respectfully and responsibly maintained by all users, managers, and collectors of the data
Data retention	The continued storage of data for compliance or business reasons
Data security	The tools, policies, practices, and procedures used to protect data from being accessed, manipulated or destroyed or being leveraged by those with a malicious intent or without authorization, as well as the corrective actions taken when data breaches are suspected or have been identified.
Data sharing policies	Adopted plan around the practice of making data available to others
Enabling Technologies	An innovation that alone or paired with an existing solution produces a better end user solution at a rapid rate
Graphical User Interface	A type of interface that allows a user greater interaction, i.e. icons, menus
Managed Care Organization	Insurance companies that contract with Ohio Department of Medicaid to offer Medicaid as an insurance care plan to eligible Medicaid members (services include NEMT)
Non-Emergency Medical Transportation	Transportation provided for Medicaid members for appointments that are not needed for an emergency
Ohio Department of Medicaid	The State of Ohio's department which focuses on the delivery of Medicaid services
Ohio Department of Medicaid Benefits System	Ohio Department of Medicaid's membership database
Open-data	Information that is freely available for anyone to use and republish as they wish
Open-source concepts	The notion of open collaboration and voluntary contribution for software development by writing and exchanging programming code
Performance metric	A measurement used to determine how a project is performing

Term	Definition
Personally Identifiable Information (PII)	Information used in security and privacy laws that can be used to identify an individual, such as vehicle, driver, and payment information
Real-time data	Information that is delivered immediately after collection
Sidewalk Labs	A Google company and a national partner in the USDOT Smart City Challenge
Third-party	Organizations not affiliated with the Smart Columbus Program
Transportation Network Companies (TNCs)	Private businesses, non-profits, and quasi-governmental agencies that offer one or more types of transportation for use in exchange for payment

Source: City of Columbus

THE CITY OF
COLUMBUS
ANDREW J. GINTHER, MAYOR