

4-2019

# Addressing Non-Emergency Medical Transportation Needs in Androscoggin County

Erin Hazlett-Norman

*Bates College*

Maggie O'Shea

*Bates College*

Grace Warder

*Bates College*

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# Addressing Non-Emergency Medical Transportation Needs in Androscoggin County

Erin Hazlett-Norman, Maggie O'Shea, and Grace Warder

Completed in Collaboration with  
Community Concepts Inc.

In Partial Completion of a Capstone in Environmental Studies  
Bates College  
April 2019

# Executive Summary

Public health and social equity hinge upon the accessibility of medical services to all. Lack of access to transportation for routine and non-emergency medical appointments poses a significant barrier to appointment attendance, a barrier that disproportionately impact low income people and other marginalized groups. Healthcare providers also suffer major financial losses when patients are unable to attend their appointments. Prior research and community forums in Androscoggin County, Maine have identified several shortcomings to existing local non-emergency medical transportation (NEMT) services, illuminating the need for transportation options that better address the specific needs of the local population. In this report, we identify unmet transportation needs in Androscoggin County, detail the findings of our research on alternative models of NEMT across the United States, and propose a pilot program for a NEMT system tailored to the local needs and resources in Androscoggin County.

This project is conducted in collaboration with Community Concepts Inc. (CCI). We build on the work of a previous Environmental Studies Capstone group from Bates College that identified the specific shortcomings of the current NEMT ride brokerage system from the perspective of the New Mainer community. Through consultations and scholarly research, we found a number of elevated transportation barriers faced by New Mainer users, rural users, users with disabilities, and non-MaineCare users. Our comparative study of different NEMT programs in Maine, New York, Minnesota, and Oregon allowed us to identify the range of different vehicles, transport styles, scheduling services and payment options that exist in NEMT services on a national scale. We synthesize the findings of this research into a proposal for a six month NEMT pilot program to be implemented in Androscoggin County.

The pilot program we propose would be operated by CCI as a means of testing out the viability of an alternative to the current LogistiCare system. The program would operate two vans, one as a demand responsive, taxi-style service, and one on a fixed route with pick-up points in the downtown Lewiston-Auburn area and drop-off points at major healthcare providers. In order to address local and cultural needs present in Androscoggin County, our proposal recommends a multilingual ride-scheduling service, driver trainings on implicit bias and mental health first aid, and a representative community board to receive feedback and implement changes in the program moving forward. Fare options and potential funding options are also discussed. We conclude with a set of recommendations for next steps for working towards more accessible, culturally appropriate NEMT services in Androscoggin County.

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## **Acknowledgements**

We would like to first acknowledge our community partners, Kirk Bellevance and Ruby Bean from Community Concepts Inc, for providing much needed context and information in the fielding of our innumerable questions and constant support throughout the project. We greatly appreciated the opportunity to work alongside with and learn from CCI throughout the semester. We would also like to thank Francis Eanes and Karen Palin who provided much needed guidance and feedback throughout the semester, for which we are incredibly grateful. Alongside our professors, our classmates provided feedback both on our process and presentations. We are both grateful for their support and excited to be a part of a group of students that has produced such important and wonderful work. Finally, we would like to express our deepest gratitude to all of the community organizations and members that provided information and support to us. We would have been unable to even begin this project without all of these individuals' willingness to provide insight and assistance. We hope that the end result is of use to the community that spent so much time supporting us throughout these three months.

# 1. Introduction

Missed medical appointments due to lack of access to transportation pose a vital public health concern. In the U.S., 3.6 million people miss or delay at least one appointment yearly because of their inability to overcome transportation barriers (Myers 2015). Missed medical appointments are associated with delayed care for patient illnesses and chronic health conditions, lack of specialty care, and increased visits to emergency departments, all of which are harmful to patient health outcomes (Health Outreach Partners 2017; Kim et al. 2009). Patient absenteeism is very costly for healthcare providers as well; one missed appointment costs an average of \$175 to the provider (Health Outreach Partners 2017).

Non-emergency medical transportation (NEMT) is an important resource for individuals and families who do not have access to personal means of transportation to and from medical appointments (Kim et al. 2009). In many urban areas and major metropolis cities, this problem is abated through comprehensive and established public transportation systems. But such systems can be unreliable and do not always meet the needs of local populations, with certain groups more acutely impacted than others. A significant body of scholarly research illuminates the heightened transportation barriers faced by immigrant and refugee populations (Cristancho et al. 2008; Morris et al. 2009; Wafula and Snipes 2013). Further studies have shown that for low income people and people who live in rural areas, transportation poses an even greater barrier to healthcare access than for their wealthier or urban counterparts (Dobbs et. al 2017; Myers 2015; Thomas and Wedel 2014). The Code of Federal Regulations (CFR) currently requires states to ensure that Medicaid beneficiaries have access to NEMT services to transport them to health care providers (Centers For Medicare and Medicaid Services (CMS) 2016). However, Medicaid programs vary from state to state and the federal CFR requirement does not ensure access to NEMT on a regional basis. (CMS 2016).

The state of Maine presents distinct challenges for patient healthcare access and NEMT service provision. One of the state's primary NEMT contractors is an Atlanta-based company called LogistiCare (Caldwell et al. 2018). LogistiCare contracts rides for individuals that are eligible for the state's medicaid coverage known as MaineCare (Maine.gov 2019). Approximately 253,000 Maine residents (19.2% of the entire state population) rely upon MaineCare for insurance, with an additional 70,000 to be added to the program upon the expansion of Medicaid under the Affordable Care Act (Farwell 2017). The state also has a significant population of people living in rural areas, and more recently has experienced an influx of immigrant and refugee populations (New Mainers). All of these factors impact NEMT provision and healthcare access in Maine.

In Androscoggin County, scholarly studies and local assessments highlight New Mainers, low income residents of rural areas, and low income residents who are ineligible for MaineCare

as the primary groups for whom transportation barriers limit access to healthcare<sup>1</sup> (Caldwell et al, 2018, Dobbs et al 2017). A recent report by student researchers in Lewiston illuminates the principal barriers that impact access to NEMT services by New Mainers in Androscoggin County. Though the report focuses primarily on the New Mainer community, it illuminates a number of local challenges that should be understood to apply to all low income NEMT users. These include insufficient public transportation infrastructure, unreliable service and communication on the part of Logisticare, and the high cumulative costs of transportation over time (Caldwell et al, 2018). Frustrations raised by New Mainer participants in the student researchers' focus groups include challenges accessing services due to language barriers, existing services' incompatibility with the needs of large families, and experiences of insensitive and racist treatment on the part of transportation providers. These factors indicate a lack of cultural competency in existing local NEMT services. Low-income residents of rural parts of Androscoggin County bring the unique challenge of coordinating NEMT services over greater distances. Finally, all low-income residents who do not qualify for MaineCare present the need for alternative transportation options that do not solely rely upon Logisticare.

LogistiCare's contract as the medicaid broker for Androscoggin County is about to go up for renewal, marking the potential for significant change in the local NEMT landscape.<sup>2</sup> Lewiston-based Community Concepts Inc. (CCI), one of the transportation providers that LogistiCare contracts to provide rides in Androscoggin County, envisions an affordable, accessible NEMT system in which all user needs are met. Whether or not LogistiCare's contract gets renewed, CCI wants to develop an alternative NEMT model to be implemented in Androscoggin County. CCI has invited us to partner with them in identifying existing transportation barriers faced by local users and designing a supplemental NEMT program that seeks to overcome those barriers.

This report proposes a six month NEMT pilot program to be implemented in Androscoggin County by CCI. The proposed model aims to increase non-emergency medical appointment attendance and thus improve health outcomes for low-income Androscoggin County residents while also reducing costs to local healthcare providers due to missed appointments. In order to develop this model, the researchers first identified the specific needs and barriers faced by local NEMT users in Androscoggin County. We then evaluated different NEMT programs across the United States and, through consultation with our community partner and local stakeholders, assessed the potential of different components of these programs to address the shortcomings of current NEMT services in Androscoggin County. Finally, we synthesized our research findings into a proposal for a locally feasible and culturally appropriate

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<sup>1</sup> It should be noted that these are not mutually exclusive groups; some New Mainers are low-income, some live in rural areas, and the pool of low-income people who do not qualify for MaineCare includes recent immigrants and longtime residents alike.

<sup>2</sup> Information sourced from a personal communication with CCI.

NEMT pilot program that incorporates stakeholder feedback and includes concrete details for implementation.

## 2. Methods

**Identify → Research → Consult → Synthesize → Consult → Finalize → Present**

**Identify:** We used information gathered from a prior ENVR 417 student research group's report, scholarly sources and meetings with the following groups and individuals both to better understand existing NEMT services in Androscoggin County and to identify the specific transportation barriers and needs of stakeholders in Androscoggin County.

- *Community Concepts* -- to understand existing NEMT services and historical shortcomings as well as the interests of drivers and local healthcare providers
- *Isa Moise, Josh Caldwell, and Dylan Metsch-Ampel* -- to identify the specific needs and transportation barriers of the local New Mainer community
- *Francis Eanes and Karen Palin* -- to understand the scope of our project and identify examples of potential alternative models of NEMT

*Outcome: Local barriers and needs identified*

**Research:** We investigated and evaluated alternative models of NEMT in other cities with significant low-income and immigrant and refugee populations, as well as those that serve both urban and rural populations. This process entailed:

- Investigating the official websites and other online information regarding alternative NEMT services in areas with similar demographics
- Identifying 6 alternative NEMT models that are relevant to the specific NEMT needs in Androscoggin County (alternative models listed in appendices)
- Developing a rubric to evaluate the potential of each model to address the specific logistical and cultural needs of NEMT users in Androscoggin County with a standardized set of criteria. (Blank and filled-out rubrics for each model can be found in the appendices)
- Identifying key characteristics of alternative models that could be implemented to overcome local NEMT barriers and needs in Androscoggin County

*Outcome: Alternative NEMT models identified, evaluation initiated*

**Consult:** We conducted consultations with representatives from the following stakeholders. In these meetings, we gave informal presentations on the findings of our preliminary research and queried the stakeholder representatives about the feasibility of implementing various

characteristics of alternative NEMT models in Androscoggin County. This process also allowed us to identify specific needs and interests of each stakeholder.

- St Mary's Regional Medical Center
- Tri-County Mental Health
- Lewiston Auburn Regional Community Health Committee
- Healthy Androscoggin
- Community Concepts Inc.

*Outcome: Evaluation completed, stakeholder interests and needs identified*

**Synthesize:** Drawing upon the findings of our research and consultations, we synthesized the relevant characteristics of alternative models into a single proposed NEMT pilot model for implementation in Androscoggin County. This process entailed:

- Selecting the transit style of the pilot model (fixed-route vs. demand-responsive vs. integrated into public transit)
- Identifying a set of driver-trainings and potential ride-scheduling options to address the specific cultural needs of NEMT users in Androscoggin County.
- Delineating a governance structure and feedback process for the pilot model
- Drafting an outline of the budget components for the pilot model
- Identifying information needed to complete a final proposal for the pilot model
- Developing a set of questions for stakeholders to obtain identified information

*Outcome: Stakeholder needs and interests incorporated, final proposal initiated*

**Consult:** We conducted final consultations with the following stakeholder representatives to obtain locally specific information to incorporate into our final proposal:

- *Fowsia Musse and Héritier Nosso from Healthy Androscoggin* -- to clarify details about language translation, van capacity, driver training, route options, and governance structure that would make our pilot model as accessible and culturally appropriate as possible for the New Mainer community
- *Kirk Bellavance and Ruby Bean from Community Concepts* -- to obtain specific information about budget components and existing transportation infrastructure, and to identify route options that would make our pilot model as accessible as possible to all low-income NEMT users in Androscoggin County.

*Outcome: Detail and specificity of final proposal enhanced*

**Finalize:** We incorporated the information and feedback from these final stakeholder consultations to complete our final proposal of a NEMT pilot model to be implemented in Androscoggin County. This proposal includes:

- An overview of the proposed alternative NEMT pilot model
- A description of how it addresses the needs of all identified stakeholder groups

- An itemized proposed budget
- A description of the proposed governance structure and feedback process
- A description of the proposed ride-scheduling process
- A map of the proposed route and chart of the daily ride schedule
- A discussion of potential limitations and shortcomings of the proposed pilot model and recommendations for next steps

*Outcome: Proposal finalized*

**Present:** We held a meeting with representatives from all identified local stakeholder groups and gave a powerpoint presentation on our proposed NEMT pilot model. We responded to questions and received feedback. We distributed copies of our written proposal to all of the stakeholder representatives.

*Outcome: Proposal presented to stakeholders*

### 3. Results

#### Phase 1: Identify

*Inventory of NEMT Needs and Barriers in Androscoggin County*

In order to develop a locally feasible proposal to address non-emergency medical transportation needs in Androscoggin County, we first conducted research to identify the unmet transportation needs and barriers faced by various local populations as well as potential locally viable solutions. Our research process began with an examination of scholarly sources, followed by a series of informal consultations with our community partners from Community Concepts Inc., the group of student researchers that worked on this project last semester, and our capstone advisors. This preliminary research phase allowed us to identify the following four demographic groups that have specific medical transportation needs that existing NEMT services in Androscoggin County fail to fully meet:<sup>3</sup>

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<sup>3</sup> It is important to note that users with disabilities is an additional demographic group that we did not initially identify in our background research on NEMT in Androscoggin county. The unmet transportation needs of users with disabilities were brought to our attention in our consultation with Tri-county mental health services. It also deserves note that the four groups we identify are not mutually exclusive. Some users, such as New Mainers with disabilities or rural residents who do not qualify for MaineCare, occupy multiple groups at once and as such experience multiple overlapping transportation barriers.



This initial research, alongside further consultations with local community organizations and healthcare providers, helped us determine the specific transportation needs and barriers experienced by each of the above groups. Broken down group by group, these needs and barriers are:



- Significant language barriers encountered in the ride-scheduling process, as well as in communication with NEMT drivers.
- Racist and culturally insensitive treatment by NEMT drivers
- Incompatibility of existing NEMT services with the transportation needs of large families. This barrier arises when parents need to bring more than one child along to a medical appointment, a practice that is currently disallowed by LogistiCare policy.



- Greater distance between residences and medical appointments that make transportation options more expensive and limit access to public transit.
- Widely dispersed residences that make it challenging to coordinate carpools or joint pick-ups for transportation services



- Challenges walking “the last mile” if transportation services cannot provide door-to-door service
- Diverse mental health needs that may arise in the process of transportation to which NEMT drivers may not be prepared to respond



- Lack of access to affordable transportation services. This presents a particular barrier to low-income users who, due to owning a house or some other asset are ineligible for transportation assistance but may still struggle to transportation cover cost.

## **Phase 2: Research**

### *Comparative Study of NEMT Programs*

In order to identify potential solutions for the above unmet transportation needs in Androscoggin County, we conducted online research on a variety of different NEMT programs across the country. We began this phase of our research by identifying cities and towns with significant immigrant and refugee populations. We then expanded our search to include programs that serve cities of comparable size to Lewiston-Auburn that are surrounded by significant rural areas, as well as regions that experience similar weather challenges. We identified the following five transportation programs as relevant models with which to conduct our comparative study of NEMT services on a national scale:<sup>4</sup>

- Waldo Community Action Partners (Waldo County, Maine)
- Choice One Transportation (Rochester, New York)
- Assisted Transport (Minneapolis, Minnesota)
- Arrowhead Transit (Northeastern Minnesota)
- Ride Connection (Portland, Oregon)

In order to conduct a comparative analysis, we developed a rubric with which to identify and assess various components of each of the above NEMT programs. The rubric allowed us to evaluate programs of a variety of geographic scales and ridership capacities using a consistent set of questions about users, carriers, destinations/geography, funding and fees, local and cultural needs, and process of implementation. For a complete set of the rubric questions, see Appendix III. The rubric was intended to help us parse out different components of each program that might be relevant to transportation needs in Androscoggin County. We filled out a rubric for each NEMT program we researched with as much information as could be gleaned from online sources, which was, unfortunately, fairly limited for most of the programs. We attempted to supplement this online research with informal phone interviews with staff members at the various different NEMT programs, but, with the exception of Waldo Community Action Partners, we had minimal success making contact. Though the limited availability of information about the different NEMT programs proved to be a significant setback to the research process as we had initially envisioned it, it forced us to rely more heavily on consultations with local stakeholders in the development of our proposed solution. This ultimately had the positive impact of allowing us to tailor our final proposal more closely to the local transportation needs and barriers in Androscoggin county. What follows is a brief synopsis of each NEMT program we researched, accompanied by a list of the key takeaways that proved useful for developing our proposed solution. Contact information regarding each system can be found in Appendix II.

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<sup>4</sup> For contact information and a link to the webpage of each NEMT program, see Appendix II

*Waldo Community Action Partners:*<sup>5</sup>

Waldo Community Action Partners (Waldo CAP) is a medicaid broker based in Waldo County, Maine. The program is also affiliated with MidCoast Connector. Waldo CAP covers all riders who qualify for transportation assistance under MaineCare. The program's services are also available at an affordable price for those who are not eligible for MaineCare transportation assistance. Waldo CAP brokers a series of private cab companies who are called by a dispatcher after a request for a pickup/drop off is made. The companies are called in order of which company offers the lowest rate, providing an incentive for local cab services to offer affordable rates. Waldo CAP provides rides to users in Belfast and the surrounding rural areas and travels as far as Bangor, Augusta, Waterville, or Rockland for pick-ups and drop-offs. Waldo CAP is governed by a community board made up of program employees and local transportation users. The Waldo CAP community board is designed to receive feedback from the local community and make changes to the transportation in response to local needs.

Key Takeaways:

- Available discounted ride service for non-MaineCare recipients
- Brokerage of multiple private cab companies with built-in incentives for lower rates
- Successful implementation of a representative community board

*Choice One Transportation:*

Choice One Transportation is a private NEMT provider based in Rochester, New York. The company offers a fully demand responsive, taxi-style service. Choice One operates a fleet of ADA compliant SUVs and vans driven by professional drivers who must pass a series of background and drug tests. The company provides service to people across Rochester, a city with a large immigrant and refugee community (including a significant population of Somali immigrants). Choice One offers rides to users who are eligible for transportation assistance under Medicaid, iCircle Care, and Fidelis Care. The company also has a private pay option. All rides are scheduled over the phone. Choice One operates a different ride-scheduling phone number for each payment option. Some of these numbers have multiple language options (English, Spanish, Russian, and other), while others are only in English.

Key Takeaways:

- Privately operated, demand responsive service
- Professional drivers
- Multilingual ride-scheduling phone services
- Multiple insurance plans accepted in addition to a private pay option

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<sup>5</sup> Waldo CAP was the only NEMT program that we were able to have an extended phone conversation with. As such, we were able to garner a more in-depth understanding of the behind the scenes functioning of the program (governance structure, rate incentives etc) than for the other NEMT programs we researched.

### *Assisted Transport:*

Assisted Transport is a privately owned, small scale NEMT provider based in Minneapolis, MN. The program serves the Twin Cities and their immediate surroundings, a primarily urban area with a significant immigrant and refugee population. Assisted Transport offers door-to-door demand responsive taxi-style services for ambulatory, wheelchair, and stretcher clients. All of the program's vans are ADA compliant and equipped with hydraulic wheelchair lifts and stretcher lock downs. All rides are scheduled over the phone. Assisted transportation offers over-the-phone translation and face-to-face interpretation services in 200 languages.

#### Key Takeaways:

- Door-to-door demand responsive service
- Wheelchair and stretcher accessible vehicles
- Extensive interpretation and translation services

### *Arrowhead Transit:*

Arrowhead Transit operates a dial-a-ride style public bus service that covers eight predominantly rural counties in northeastern Minnesota. In addition to medical appointments, the service provides rides to job sites, shopping centers, and a variety of other destinations. Fees are charged on a pay-by-ride basis. All Arrowhead Transit buses are equipped with a farebox and tickets for sale in books of ten. Tickets and unlimited monthly passes can also be purchased online. The service is open to all passengers regardless of insurance status. Children under five ride for free, children ages six to twelve are half price, and disabled veterans and people over ninety ride for free with a waiver. Arrowhead Transit buses provide door-to-door pick-ups and drop-offs. All rides are scheduled by phone through a single phone number. Rides can be scheduled between one month and one hour in advance. All buses are equipped with built-in child seating, a wheelchair lift, and capacity for securing up to three wheelchairs simultaneously. The cost of any given ride varies by distance. Pricing charts and bus schedules for every county are available online. Rides within a county never exceed \$4. Arrowhead Transit employs part time drivers as well as seasonal, substitute, and casual drivers and pays \$14.16 per hour. The service advertises job openings to local residents and provides trainings for hirees to obtain CDL licenses. In addition to the dial-a-ride bus service, Arrowhead Transit also operates the Rural Rides program that provides employment-related transportation assistance such as bus and cab vouchers, temporary volunteer drivers, and support with transportation budgeting and planning.

#### Key Takeaways:

- Pay-by-ride bus service available to all passenger regardless of insurance status
- Pricing charts and bus schedules available online
- Hiring and training local residents to be drivers
- Unlimited monthly passes
- Child-appropriate and wheelchair accessible vehicles

### *Ride Connection:*

Ride Connection is a non-profit based in Portland, Oregon that serves local populations with limited access to transportation. The program operates in Clackamas, Multnomah, and Washington counties, coordinating and providing transportation to recreational areas, grocery stores, community centers, and non-emergency medical services. Ride Connection offers a call service in which a staff member connects callers to the best transportation option based on their specific needs. These options range from public transit to the organization's own programs: a door-to-door demand responsive service and a deviated-route "community connector" bus. The door-to-door option is a taxi-style service that Ride Connection operates in collaboration with other local transportation agencies. The community connector is a fixed-route bus system that will pick-up and drop-off users up to one half mile from the typical route if they call in advance. For both the door-to-door service and route deviation requests, users must call two days in advance. Ride Connection primarily serves seniors and people with disabilities, though in more rural areas the general public make use of the program as well. All of the organization's services operate free of charge. Ride Connection receives most of its funding through federal and state grants, though they also accept donations.

#### Key Takeaways:

- Over-the-phone transportation planning support
- A number of systems running together, all free of charge
- A fixed-route bus system with deviated route options
- Drop-off points beyond medical services
- Grant funded

### **Phase 3: Consult**

#### *Assessment of Potential Solutions*

In this phase of our research, we conducted a series of consultations with local community organizations and representatives from hospitals and other healthcare providers, to assess the feasibility of applying components of the alternative NEMT programs in the specific context of Androscoggin County. The locally specific information we garnered from these meetings is reflected both in the following charts of needs, barriers, and potential solutions, and in our final proposal.



Needs and Barriers:	Potential Solutions:
<ul style="list-style-type: none"> <li>● Language Barriers</li> <li>● Racist and Culturally Insensitive Treatment</li> <li>● Incompatibility with Large Families</li> </ul>	<ul style="list-style-type: none"> <li>● Multilingual Scheduling</li> <li>● Multilingual Drivers</li> <li>● Community Board</li> <li>● Implicit Bias Training</li> <li>● Buses and high capacity vans with child seats</li> </ul>



Needs and Barriers:	Potential Solutions:
<ul style="list-style-type: none"> <li>● Greater Distance from Medical Appointments</li> <li>● Widely Dispersed Residences</li> </ul>	<ul style="list-style-type: none"> <li>● Demand-responsive Taxis and Buses</li> <li>● Door-to-Door Pick ups</li> </ul>



Needs and Barriers:	Potential Solutions:
<ul style="list-style-type: none"> <li>● Walking the “Last Mile”</li> <li>● Diverse Mental Health Needs</li> </ul>	<ul style="list-style-type: none"> <li>● Door-to-Door Pick Ups</li> <li>● Mental Health First Aid Training</li> </ul>



Needs and Barriers:	Potential Solutions:
<ul style="list-style-type: none"> <li>● Lack of Access to Affordable Transportation</li> </ul>	<ul style="list-style-type: none"> <li>● Affordable Pay-by-Ride fare options</li> </ul>

After identifying these potential solutions, we synthesized them into a draft proposal for a six month NEMT pilot program to be implemented in Androscoggin County. We conducted a final round of consultations with our community partner and other stakeholders to assess the local viability of our draft proposal, and made adjustments as appropriate. This concludes our discussion of the findings of our research process. We move now to a description of our proposed solution.

## 4. Proposed Solution: Six Month NEMT Pilot Program

Drawing upon the results of our research, we propose a six-month pilot program that aims to enhance the accessibility and cultural competency of NEMT services in Androscoggin County. This pilot program would be operated by Community Concepts Inc. as a supplement to their existing transport services that are brokered by LogistiCare. We chose to limit the scale and time frame of our proposed solution in order to make it more logistically feasible and easily adaptable in the process of scaling up. While the ultimate goal of this project is to increase non-emergency medical appointment attendance, we acknowledge that a pilot program of such limited scale is unlikely to fully address all of the transportation barriers we identified in our research. As such, we have the following, more attainable goals for our proposed pilot program:

- To provide an actionable next step towards improving NEMT services in Androscoggin County
- To offer a mechanism for community input and feedback in shaping local NEMT services
- To test out the local viability of solutions from other NEMT programs across the country
- To provide evidence of improvement in services to assist in obtaining funding in the future

Our proposed pilot solution is outlined below, divided into six components: transit options, ride scheduling, driver trainings, governance, funding, and a cost-benefit analysis. We recognize that it may not be logistically feasible to implement all of these different components at once, and as such we discuss each element of the program separately in hopes that individual parts of the proposal might be useful even if the pilot program cannot be implemented in its entirety. We conclude our proposal with recommendations for next steps to expand the program in geographic scale and ridership capacity.

### 6.1 Transit Options

Our proposed pilot program includes two transit options: a fixed route van and a demand responsive van. We recommend implementing these two distinct options both as a means to better meet the diverse needs of local NEMT users and as an opportunity to compare and receive feedback on the local feasibility of multiple different modes of transit.

In our proposed pilot program, the two vans would both be ADA compliant, wheelchair accessible seven passenger vans equipped with at least two car seats for child safety. They would be operated by two full-time professional drivers hired by Community Concepts Inc., and ride scheduling would be coordinated by the organization's existing staff.

The fixed route van would travel along a preset loop with regular scheduled stops near residential areas and community spaces in the Lewiston-Auburn downtown areas, and stops at major medical services. See figures 1.1 and 1.2 for a map and schedule of one full circuit of the proposed fixed route. The pick-up and drop-off points we selected were developed in consultation with community stakeholders and could easily be adjusted in response to user feedback. Rather than calling in advance, transportation users would only have to be at a pick-up location at the appointed time in order to ride the fixed route van. Payment for the fixed route van would operate on a pay-by-ride basis with a standard rate for all passengers. In the funding section of this report, calculations are made based on \$0.50, \$1.00 and \$2.00 ride fare options to illustrate the estimated financial returns that could be expected if a given fare was charged. We do not recommend a particular fare but rather leave it up to the service operator's' discretion (with input from community stakeholders) to strike a balance between financial accessibility and financial returns.



**Figure 1.1:** Fixed Route System: Map

Stop #	Place Name	Address	Departure Time
1	Community Concepts	175 Blake St, Lewiston, ME	9:00
2	Tree Street Youth Pick Up	144 Howe St, Lewiston, ME	9:05
3	Ward's Markets	208 Pine St, Lewiston, ME	9:10
4	St. Mary's	93 Campus Ave, Lewiston, ME	9:20
5	Tall Pines Community	Tall Pines Drive, Lewiston, ME	9:30
6	CMMC	12 High St, Lewiston, ME	9:45:00
7	Gowells Variety Store	121 Hampshire St, Auburn, ME	9:55
8	Roys Foodland	70 Broad St, Auburn, ME	10:05
9	Tri County Mental Health	155 Lisbon St, Lewiston, ME	10:15
10	Community Concepts	175 Blake St, Lewiston, ME	Return to Community Concepts

**Figure 1.2:** Fixed Route System: Single Cycle Schedule

One of the primary benefits of our proposed fixed route option is that it would provide an affordable pay-by-ride option for those who don't qualify for MaineCare. Additionally, with no requirement to schedule in advance, the service would be the option of choice for transportation needs that arise unexpectedly. Likewise, the lack of a scheduling requirement eliminates the potential for confusion due to a language barrier provided users are familiar with the map and schedule of the fixed route service.

Alongside these advantages, the fixed route option has a number of limitations. With only one seven-passenger vehicle running the fixed route, the van could easily become overwhelmed by high ridership demand. Alternately, in the case of low ridership demand, the van could end up driving many unloaded miles between stops with no passengers on board. Additionally, with only one van making an hour and a half long circuit, users would either have to carefully time their appointments to match the fixed route schedule or wait for the van for extended periods of time. Another constraint of our proposed fixed route option is that, in order to keep the circuit to a reasonable timeframe, the number of stops would have to be limited. For all of the above reasons, we suggest that, once demand is demonstrated, multiple vans travelling the same route would make this option run more smoothly and efficiently and should be considered as a next step for scaling up the pilot program.

The second transit option available in our proposed pilot program, the demand-responsive van, would provide door-to-door taxi-style service. Riders would have to call at least twenty four hours in advance to schedule a ride, and paying passengers (those who don't qualify for MaineCare transportation assistance) would be charged based on the mileage of the trip. In our funding section, calculations of potential financial returns are made based on per mile costs of \$0.25, \$0.50 and \$1.00, but again, we leave decisions about pricing up to the discretion of the service operators with input from community stakeholders.

The benefits of the demand responsive option include the enhanced accessibility of a door-to-door service that eliminates the barrier of having to walk the 'last mile' to a destination. Additionally, this service would provide a more private option, a rider desire that was brought to our attention during our consultation with local stakeholders. The demand responsive option would be able to better serve rural areas that the fixed route does not reach. It would have the added benefit of guaranteed space for multiple family members or companions, making it a more dependable option for parents who need to travel with multiple children at once. A further benefit of this option would be the flexibility it allows for in the timing of appointments.

One of the major limitations of the demand responsive transit option is that the price of rides would climb steeply for those needing to travel longer distances, disadvantaging users from remote rural areas. The demand-responsive option's requirement that rides be scheduled over the phone in advance would also introduce the potential for a language barrier and make the service less flexible for last minute transportation needs. Additionally, the service could easily be overwhelmed by demand if transportation was requested for long distances or conflicting appointments. These limitations lead us to suggest that, similar to the fixed route option, once demand is demonstrated, multiple vans operating simultaneously would enhance the effectiveness and potential range of the demand responsive transit option.

## 6.2 Ride Scheduling

A system for scheduling rides would be required for the demand responsive van in our proposed pilot program. Our aim for the ride scheduling component is to increase the accessibility of the program for non English-speaking users. Through our consultation with representatives from the New Mainer community, we learned that an over-the-phone calling service would likely be the most technologically accessible platform for ride scheduling for many immigrant and refugee NEMT users. Additionally, this consultation helped us identify the following seven language options that would meet the diverse language needs of a majority of potential NEMT users in Androscoggin County: English, French, Portuguese, Spanish, Somali, Arabic, and Swahili. The valuable input we received during our consultation with New Mainer representatives leads us to propose three different potential multilingual calling service options for the pilot program, each with their own benefits and drawbacks.<sup>6</sup>

The first ride scheduling option we propose for the demand responsive van is a multilingual calling service with an automated menu of language options. Similar to the current scheduling system employed by LogistiCare, users wishing to schedule a ride would call the main phone number and from there would listen to an automated menu of the seven languages identified earlier and be directed to dial the appropriate number to select the language of their choice (e.g. ‘dial one to schedule a ride in English, marque dos para programar un viaje en español...’). The user would then respond to a number of pre-recorded questions in the language they had chosen in order to schedule their ride. This fully automated multilingual calling option would have the benefit of operating through one central phone number, and would likely be significantly less expensive than paying for an in-person or over-the-phone translation service. Significant issues could arise, though, if users have specific needs or questions that cannot be answered by the pre-recorded responses. We also learned from our consultation with representatives from the New Mainer community that non English-speaking users often experience frustration and confusion if they have to listen to multiple different language options before hearing one that they understand. This would be a further limitation of the fully automated call scheduling service.

The second ride-scheduling option we propose aims to address the shortcomings of the first. In this option, there would be separate phone numbers for each of the seven different language options, eliminating the need for users to listen to a menu of different language options before selecting the one of their choice. Rather than a series of automated questions, this service would connect users to a person who speaks their language and is able to guide them through the scheduling process. This second option would be significantly more user friendly, but it presents

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<sup>6</sup> It is important to note that we were not able to find much information regarding the cost of the three different options, and as such the cost of ride scheduling is not reflected in our final budget calculations. We recognize that this is a shortcoming of our proposed pilot model, and suggest that further research into the different options’ costs would be an important next step for implementing the pilot model we propose.

the added logistical challenge and financial cost of contracting people who speak each of the seven identified languages to respond to user calls and assist in the ride scheduling process.

The third ride scheduling option we propose attempts to remedy the limitations presented by the first two. Recommended to us by Hérítier Noso at our presentation to stakeholders, this third option would make use of existing translation and interpretation services at hospitals and other clinics. With this ride scheduling option, we propose that non English-speaking users would be assisted with the ride scheduling process at the time when they schedule their medical appointment, whether that occurs in person, or over the phone with the health provider's translators. Translators would then have to make an additional phone call to communicate the user's ride scheduling needs to Community Concepts Inc. While we acknowledge that it would require significant communication and collaboration between health providers and the pilot program coordinators, we see potential for enhanced accessibility and logistical feasibility in this third ride scheduling option.

In addition to these three multilingual calling service options, we fielded questions and suggestions in a number of our stakeholder consultations about the possibility of using a smartphone app or other online interface similar to Uber™ or Lyft™ for ride scheduling. Our partners at CCI likewise informed us that they are looking into different online platforms to streamline their existing transportation services. Though we chose to focus on face-to-face and over-the-phone scheduling options in this proposal because of the issue of technological accessibility that was brought to our attention, we acknowledge that there is potential for a supplementary online option to eliminate the need for a twenty four hour advance notice for ride scheduling, making the process more adaptable for users' schedules. We recommend that, if an app or online interface is implemented, the diverse language needs and range of access to technology of NEMT users in Androscoggin County should be taken into account.

### *6.3 Driver Trainings*

One of the major shortcomings of the current NEMT system in Androscoggin County that was brought to our attention throughout our research is that of driver insensitivity and bias. In the current system brokered by LogistiCare, numerous users from the New Mainer community have experienced racist and culturally inappropriate treatment from drivers (Caldwell et al. 2018). Likewise, we learned in our consultation with a representative from Tri-County mental health that many drivers are unequipped to respond to the diverse mental health needs of patients that can arise during a transport. These issues are compounded by the fact that many NEMT drivers in Androscoggin County work on a volunteer basis, and as such there is limited accountability and little incentive for them to change their behavior. In response to these shortcomings, we propose hiring local community members as full-time, paid drivers for both the fixed route and the demand responsive vans in our pilot program. Additionally, we recommend two driver trainings aimed at enhancing the cultural sensitivity and accessibility of

the program to users of diverse mental health needs. The cost of the two trainings and two full time wages are included in the budget calculations for our proposed six month pilot program.

We recommend hiring two local community members who are familiar with the distinct cultural and demographic landscape of Androscoggin County as the full time drivers for both pilot program vans. We suggest that proficiency in two or more of the seven languages identified in the ride scheduling section should be considered a highly preferable quality in applicants for the two driver positions.

Through our consultations with local community members, we identified two trainings that we propose as requirements for the drivers that would be employed in our pilot program. The first is an implicit bias training offered by Healthy Androscoggin. The aim of this training would be to help drivers become more culturally competent, aware of their own assumptions, and better able to make all passengers feel safe and respected during the transit process.

The second training we propose, recommended to us by a representative from Tri-County Mental Health Services, is a workshop offered by the national organization Mental Health First Aid. This training would be intended to help drivers become more aware of the diverse social and emotional needs of their passengers, and prepare them to respond to situations that could arise during a transport. For links to the websites of the organizations that run these two trainings, see Appendix VI.

While we believe these two trainings would go a long way towards addressing the issue of driver insensitivity and bias, we also recognize that trainings alone cannot fully solve the problem. As such we recommend that these trainings, and any additional trainings that might be added in the course of scaling up the pilot program, be accompanied by an accessible, thorough feedback process that takes users experiences and concerns into account and adapts the program to best suit user needs and preferences. Our recommendations for such a feedback process are discussed at length in the following section.

#### 6.4 Governance

The need for an effective way to integrate user feedback leads us to propose a representative governance structure for our proposed pilot program. We recommend the formation of a community board composed of local stakeholders to oversee the implementation and strategic growth of the pilot program. We suggest that this board include representatives from the following groups and organizations:<sup>7</sup>

- Community Concepts Inc.

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<sup>7</sup> These are the preliminary stakeholders that we identified through our consultation. We acknowledge that there are probably other interested parties that we have not thought of, and that, if the pilot model is expanded to a greater capacity, additional perspectives will likely merit representation on the community board.

- Local healthcare providers, including Central Maine Medical Center, St. Mary’s Regional Medical Center, and Tri-County Mental Health
- Local community organizations such as Healthy Androscoggin
- Public transportation authorities
- Local Government
- Androscoggin County residents who use NEMT services, especially New Mainer users, rural users, users with disabilities, and non-MaineCare users

This governance model, sourced from our research on different NEMT programs across the US, is intended to provide an avenue for dialogue between people involved and impacted at every level of the local NEMT system. We recommend that efforts be made to give equal voice to all members of the board and to center the experiences and perspectives of NEMT users. We believe that the implementation of a community board would be pivotal to the success of scaling up our proposed pilot program in a manner that effectively addresses local transportation needs and barriers in a culturally appropriate and fully accessible manner.

We recommend that the community board meet regularly (monthly or bi-monthly) before and during the implementation of the pilot program. We suggest a number of primary responsibilities that the board should take on. The first of these responsibilities is receiving and incorporating feedback from NEMT users on their experience of the pilot program. This feedback could be sought out in a number of different ways, including an optional post-ride survey, published phone numbers for various community members on the board who could field questions and concerns, periodic board meetings that are open to the community, and intermittent ride-along tests in which board members ride in each of the vans, noting their own experiences and asking fellow passengers about theirs. The second primary responsibility we envision for the community board is to assess the efficacy and accessibility of the ride scheduling service and fixed route stops, drawing upon user feedback to recommend changes to the route or scheduling process. The third responsibility we suggest for the community board is to manage the program budget and identify potential funding sources. The final responsibility of the community board would be to implement change and increase the geographic scale and ridership capacity of the program as they see fit.

### *6.5 Funding*

Funding for our proposed pilot program can be divided into two subcategories: program budget and potential funding sources. Table 1 shows an itemized budget for each transit option. The most significant costs are the drivers’ wages and gas for the vans. Price of gas is the only variable cost between the two transit options. The numbers of miles driven was estimated based on numbers that our partners at Community Concepts Inc. provided based on the demand-responsive system that they currently run. We made our calculations under the

assumption that the number of miles driven by the demand responsive van will be half that of CCI's other vans because of the presence of an alternative fixed route option. Additional costs accounted for in our budget are six months of commercial lease and insurance coverage for both vans, gas and regular oil changes, wages for two full time drivers paid \$13 per hour, and mental health first aid and implicit bias trainings for each driver. The budget does not include child car seats because CCI already owns these. The total estimated cost of our proposed six month pilot program is \$58,328.40.

Table 1:

Budget for Fixed Route System:

Item	Cost over Six Months
Gas for van	\$15,566.40
Drivers Wage	\$12,480.00
Van Insurance	\$792.00
Oil Change for Van	\$360.00
New Van Commercial Lease	\$3,264.00
Implicit Bias Training	\$250.00
Mental Health First Aid Training	\$5.00

**Total: 32, 717.40**

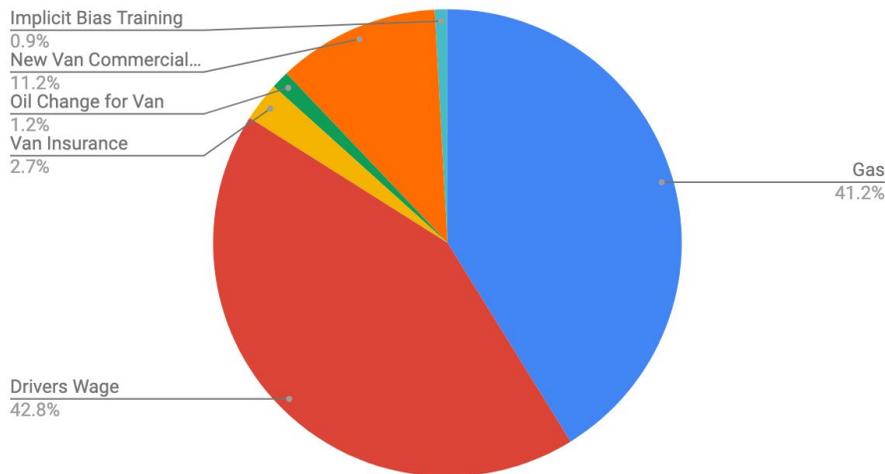
Budget for Demand-Responsive System:

Item	Cost over Six Months
Gas for Taxi	\$8,460.00
Drivers Wage	\$12,480.00
Van Insurance	\$792.00
Oil Change	\$360.00
New Van Commercial Lease	\$3,264.00
Implicit Bias training	\$250.00
Mental Health/First Aid Training	\$5.00

**Total: \$25,611.00**

**Total Pilot Program Cost: \$58,328.40**

Budget Breakdown for Proposed Pilot Program



**Figure 2:**

Breakdown by percentage of total cost distributions in combined fixed-route and demand-responsive programs within the proposed six month pilot program

Given the cost of the program there is significant need for funding. We recommend grants as an initial funding source,<sup>8</sup> but recognize that, in the process of scaling up, the program would benefit from additional, more sustainable funding sources. Due to the significant cost of missed medical appointments to County healthcare providers, we identify Central Maine Medical Center and St. Mary's Regional Medical Center as potential collaborators and funding contributors for the NEMT program if it proves to increase medical appointment attendance. Associated with this potential sustainable funding source are legality challenges along with lack of clear data on the financial cost of missed medical appointments. Please find the cost benefit analysis of a hospital-funded program in Appendix VI.

In addition to these potential outside funding sources, charging pay-by-mile (for the demand responsive van) and pay-by-ride (for the fixed route van) fares to riders who do not qualify for MaineCare would make it possible for the pilot program to generate revenue. Figures 3 and 4 chart out the potential revenue generated by various options for rider fares under variable conditions of ridership.

Figure 3 illustrates what percentage of the demand-responsive program cost would be covered by fares ranging from \$0.25 to \$1.00 per mile if the van travels distances ranging from 15 to 100 miles per day. These mileages are derived from the number of miles driven by Community Concepts Inc.'s existing demand-responsive vans. They reflect the assumption that approximately half of the riders would pay fare (the other half would be eligible for MaineCare transportation assistance), resulting in paid miles per day equivalent to half of the miles per day driven by CCI's other vans.

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<sup>8</sup> See Appendix V for a list of potential grant opportunities. We only did very preliminary research into grant options and recognize that there are likely many other appropriate grants not identified on our list.

## Demand-Responsive: Pay-by-Mile Fare Options

Six Month Pilot Program

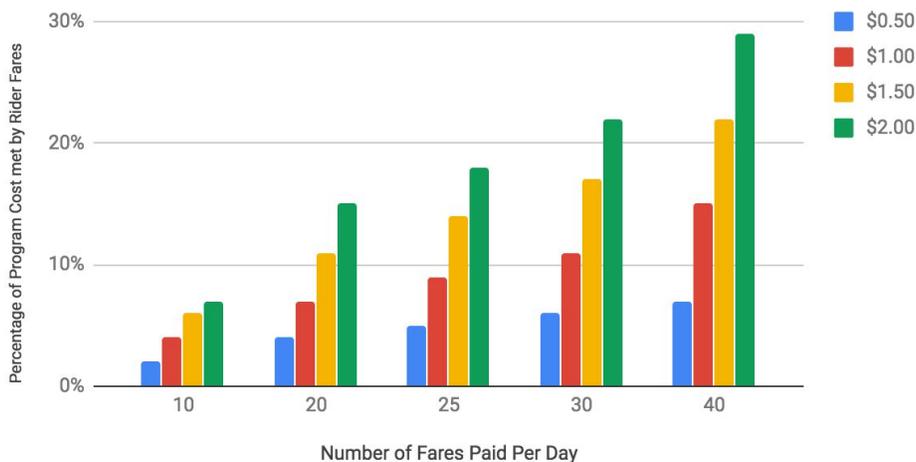


**Figure 3:** Graph of the percentage of demand-responsive system cost met by rider fares according to each fare option and paid miles per day.

Figure 4 illustrates the same information for the fixed route system. The chart shows how much of the fixed route program cost would be covered by fares ranging from \$0.50 to \$2.00 per ride if the van provides rides for 10 to 40 passengers per day. These numbers of fares paid per day are based on estimations we were given by our partners at CCI.

## Fixed Route: Pay-by-Ride Fare Options

Six Month Pilot Program



**Figure 4:** Graph of the percentage of demand-responsive system cost met by rider fares according to each fare option and fares paid for per day.

These graphs illustrate the range of possible revenue amounts that could be gained by charging relatively low fares to those who do not qualify for MaineCare transportation assistance. It is evident in both figures that when ridership increases, the same amount of revenue can be generated by lower fares. This suggests that, the more ridership the pilot program experiences, the more affordable its rates can be while maintaining fares as a steady source of revenue. Rather than draw conclusions about the ideal fares to charge or set goals for mileage and ridership, we offer these calculations as a means to show the potential for fare-generated revenue and illustrate the relationship between mileage/ridership, revenue, and cost of fare.

## **5. Recommendations for Next Steps**

We propose this six month pilot program as an actionable next step towards improving the accessibility and cultural competency of NEMT services in Androscoggin County. We acknowledge the many limitations of our proposed model and offer the following recommendations for moving forward with the pilot program and scaling it up both geographically and in terms of ridership capacity.

A number of our recommendations are aimed toward enhancing the logistical feasibility of the pilot program. The first of these would be to carefully track the number of riders in each van and increase the number of vans operating in the demand responsive and fixed route services according to the demonstrated demand. If the number of fixed route vans is increased significantly, we suggest expanding the current circuit to include pharmacies, smaller clinics, and additional residential pick up points to make the service more comprehensive and convenient. If such expansions are made, we also recommend introducing a deviated route option similar to that employed by Ride Connection as a way to make the fixed route more accessible.

In addition to these logistical expansions, we recommend two avenues of further research. Our proposed model leaves a number of unanswered questions regarding the feasibility of different ride scheduling options. As such, we advise further investigation into both the cost and accessibility of each option we outline and the viability of other alternative platforms. Additionally, in order to generate a more useful cost benefit analysis, we suggest collecting more accurate data about missed medical appointments in Androscoggin County. Specifically, we recommend an investigation of the costs incurred to the County's major healthcare providers as a result of patient absenteeism caused by transportation barriers.

Our next recommendations are for potential funding sources and collaborations. In our discussion of funding, we highlight Central Maine Medical Center and St. Mary's Regional

Medical Center as possible financial contributors to the pilot program because of the potential the program holds to improve appointment attendance and cut associated costs to the two hospitals. We recognize that such a financial commitment would require a more extensive knowledge of the cost of missed medical appointments due to transportation and a careful assessment of the costs and benefits of the proposed NEMT pilot program. As such, we encourage an ongoing dialogue and collaboration between the hospitals and Community Concepts Inc. in addressing unmet NEMT needs in Androscoggin County. In addition to the two hospitals, we identify businesses such as Walmart or Hannafords that might be interested in being added to the fixed route as a potential source of funding in scaling up the program. This point highlights a concern that was voiced during our presentation to community stakeholders that, upon expanding its stops, the proposed NEMT program could begin to enter into the domain of public transportation. As such, we recommend consultation with local public transit authorities as an important step in the implementation of the pilot program.

Our final recommendation echoes a sentiment expressed throughout the report: we believe that community representation and feedback are absolutely essential to creating a more accessible, culturally appropriate NEMT system in Androscoggin County. We highlight the community board as the single most important component of our proposal. We recommend that that, even if other elements of the pilot program prove to be unviable or ineffective, all decisions about NEMT in Androscoggin County moving forward should be made with extensive input from NEMT users, especially the groups discussed earlier who experience elevated transportation barriers.

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<http://choiceonetransportation.com/>

## **Appendix I**

### Community Contacts

#### **Kirk Bellavance**

Director Of Transportation  
Community Concepts Inc.  
240 Bates St  
Lewiston, ME 04240  
[KBellavance@community-concepts.org](mailto:KBellavance@community-concepts.org)  
(207) 795-4065



#### **Ruby Bean**

Director of Strategic Initiatives  
Community Concepts Inc.  
240 Bates St  
Lewiston, ME 04240  
[rbean@community-concepts.org](mailto:rbean@community-concepts.org)  
(207) 795-4065



#### **Joan Churchill, MS, CEO/CFO**

Community Clinical Services  
57 Birch Street, Suite 201  
Lewiston, ME 04240  
[jchurchill@stmarysmaine.com](mailto:jchurchill@stmarysmaine.com)  
(207) 513-3897 office  
(207) 890-4486



#### **Elizabeth A. Keene**

VP, Mission Integration  
St. Mary's Regional Medical Center  
96 Campus Ave #321  
Lewiston, ME 04240  
[EKeene@stmarysmaine.com](mailto:EKeene@stmarysmaine.com)  
(207) 777-8806



**Michael Hallundbaeck**

Waldo CAP: MidCoast Connector

9 Field St #201

Belfast, ME 04915

[mhallundbaek@midcoastconnector.org](mailto:mhallundbaek@midcoastconnector.org)

(207) 505-5280



**Héritier Nosso**

Promotion Coordinator

Healthy Androscoggin

124 Lisbon St 2nd Floor

Lewiston, ME 04240

[nossohe@cmhc.org](mailto:nossohe@cmhc.org)

(207) 795-5990



**Fowsia Musse**

Healthy Homes & Health Equity Coordinator

Healthy Androscoggin

124 Lisbon St 2nd Floor

Lewiston, ME 04240

[fowsiaM@hotmail.com](mailto:fowsiaM@hotmail.com)

(207) 795-5990



**Erin Guay**

Executive Director

Healthy Androscoggin

124 Lisbon St 2nd Floor

Lewiston, ME 04240

[GuayEr@cmhc.org](mailto:GuayEr@cmhc.org)

(207) 795-5990



**Holly Lasagna**

REACH Program Manager

Healthy Androscoggin

124 Lisbon St.

Lewiston, ME 04240

[lasagnho@cmhc.org](mailto:lasagnho@cmhc.org)

(207) 795-5991



**Michael Burke**  
Chief Operating Officer  
Tri-County Mental Health  
1155 Lisbon St  
Lewiston, ME 04240  
[mburke@tcmhs.org](mailto:mburke@tcmhs.org)  
(207) 783-9141



## **Appendix II**

### Alternative NEMT Program Contacts

#### **Waldo Community Action Partners**

9 Field St #201

Belfast, ME 04915

<https://waldocap.org/>

(207) 338-4769 or 1-800-439-7865



#### **Choice One Transportation**

PO Box 23433

Rochester, NY 14692

<http://choiceonetransportation.com/>

(585) 755-5900



#### **Assisted Transport**

1450 Northland Dr

Mendota Heights, MN 55120

<https://www.assistedtransportmsp.com/>

(612) 729-1156



#### **Arrowhead Transit**

Arrowhead Transit

702 3rd Avenue South

Virginia, MN 55792

<http://arrowheadtransit.com/>

(218) 735-6815



#### **Ride Connection**

9955 NE Glisan St

Portland, OR 97220

<https://rideconnection.org/>

(503) 528-1720 or (503) 226-0700



### **Appendix III**

Sample Blank Rubric:

<b><i>Name of Company</i></b>
<b>NEMT Model</b> Location: Managing Organization(s): Contacts:
<b>Users</b> Who is eligible to use services? Does this model cover people who do not qualify for medicaid? General demographics of users (age, socioeconomic status, race, immigrant status, urban/rural):
<b>Carriers</b> Mode(s) of transport (buses, taxis, volunteer drivers, vans etc): How integrated is the system with public transportation?
<b>Destinations/Geography</b> What destinations are accessible via these services? What destinations are used most frequently? What is the geographic scale of the model? (town/city/county/state) Are there relevant distinctive characteristics of the local area? (rural/urban, weather considerations)
<b>Funding and Fees</b> What is the funding source for the model? (public/private) What is the fee structure for the model? Are tokens, vouchers, or reimbursement used? Does the model cut costs for healthcare providers?
<b>Local/Cultural Needs</b> Does this model address the needs of low-income immigrant and refugee communities? How? Does this model address the needs of low-income rural communities? How? Are there specific local or cultural needs this model addresses? Are there needs that go unaddressed?
<b>Process of implementation</b> When was this model implemented? How long was the implementation process? Was it implemented in response to a crisis or more proactively? Who lead the charge in implementing it?
<b>Comments</b> (Unique characteristics of model, problems and shortcomings etc)

## **Appendix IV**

### Implicit Bias Training

- A two hour training run by Healthy Androscoggin in downtown Lewiston as part of their Health Equity Program
- \$500/person
- <https://healthyandroscoggin.org/health-equity>
- Contact: Holly Lasanga
  - [lasagnho@cmhc.org](mailto:lasagnho@cmhc.org)
  - (207) 795-5991

### Mental Health First Aid Training

- A day long training offered by the national organization Mental Health First Aid
- \$5/person
- <https://www.tri-countymhs.org/mental-health-first-aid/>
- Contact: Michael Burke
  - [mburke@tcmhs.org](mailto:mburke@tcmhs.org)
  - (207) 783-9141

## **Appendix V**

### Potential Grant Opportunities:

#### Access and Mobility Partnership Grants

- This grant is provided by the United States Department of Transportation and is specific to transportation to healthcare. It is the most directly relevant grant to this program. It is also possible there are other grants under the same department that may be relevant as well.
- Link to more information:  
<https://www.transit.dot.gov/funding/grants/grant-programs/access-and-mobility-partnership-grants>

#### REACH (Racial and Ethnic Approaches to Community Health) Grant

- This grant will only be relevant if the program targets the New Mainer community, though perhaps could assist in funding the cultural competency programs along with incorporating more New Mainers in the program itself as drivers or otherwise.
- Link to more information:  
<https://www.cdc.gov/nccdphp/dnpao/state-local-programs/reach/index.htm>

#### Behavioral and Social Research to Address Health Disparities in the U.S. (Admin Supp Clinical Trial Option)

- This grant predominantly funds research. Because of this, the programs feedback system may need to be altered slightly and the program as a whole presented as a research project investigating the efficacy of such a program to improve community health.
- Link to more information: <https://grants.nih.gov/grants/guide/pa-files/PA-19-226.html>

## **Appendix VI**

A cost-benefit analysis was conducted to express the revenue the hospitals stands to gain if they provide the long-term sustainable funding after the grants during the pilot program. This scenario may not be entirely possible given the legal regulations on hospitals in which they are not able to fund programs that may incentivize utilizing hospital services. Further research on the legality of this funding would need to be examined.

Significant numbers used in these calculations are the national average cost of an appointment to a hospital, that is \$175, (Health Outreach Partners, 2017), along with the annual financial loss to Lewiston hospitals from missed appointments due to transportation, that is \$350,000 (O’Hara 2018). Because these numbers are not necessarily the most accurate or specific to each hospital, further research is needed to make a more accurate cost-benefit analysis. Below are the findings from our analysis and the calculations that brought us to these findings.

The cost of a single demand-responsive trip was calculated as to compare it to the amount of money the hospital will earn if that appointment is attended. This requires an average number of miles per week that the demand-responsive van would drive as to find a price per mile. We supposed that the van would average 250 miles per week for this calculation.

The cost of a 20 mile demand-responsive trip: \$85.37; Hospital earns earns \$89.63:

→ Calculate average number of miles per week

→ Calculate average price per mile

$$\frac{\text{Total Cost of Demand Responsive Program}}{(\text{Average \# of miles per week} \times 24 \text{ weeks})}$$

→ Multiply price per mile by the number of miles for the trip.

→ Subtract price of trip from \$175

The cost of a single ride on the fixed route was calculated as to compare it to the amount of money the hospital would earn if the appointment was then attended. This calculation, too, required an average number of rides per week that the fixed-route would drive as to find the price per ride. We supposed the van would average 15 rides per week, which would require less than half the van to be filled on any given route cycle- it is hoped this is an underestimate which would make it a higher cost per ride than if there were more people utilizing the service.

Cost of a single ride on fixed route: \$18.18 per person; Hospital earns \$156.82:

→ Calculate average number of riders per week

→ Calculate average price per ride

$$\frac{\text{Total Cost of Fixed Route System}}{(\text{\# of riders per week} \times 24 \text{ weeks})}$$

→ Subtract price of trip from \$175

A calculation of how much the program would have to be used to pay itself back was also conducted, again utilizing the average price of a missed appointment in relation to the price of the program as a whole. That is, this number indicates how many patients would have to utilize this service and then attend their appointment to make the hospitals earn back the exact amount of the cost of the program.

With 3 users per day the program will pay itself back:

→ Calculate number of appointments (\$175) equivalent to the total cost of the program

$$\frac{\text{Total cost of Pilot Program}}{\text{Price of single appointment for hospitals}}$$

→ Divide result by number of days in pilot program (120 days)

The following calculation uses an average national price of a missed appointment and the Lewiston-specific financial loss to hospitals. Because of this, it would be valuable to recalculate this statistic with more consistently Lewiston-specific data. Still, below indicates the amount of money hospitals stand to earn over the course of six months if the program were 50% successful, that is, if it returned 50% of the patients who previously missed their appointments.

Revenue to each hospital after six months \$145,835.8:

→ Calculate the number of missed appointments according to the \$350,000 lost per hospital per year [divide this number by two given that the program is a 6 month program] and the cost of a missed appointment

$$\frac{\text{Total Annual Financial Loss to Hospitals due to Transportation Related Absences}}{\text{Cost of Single Missed Appointment}}$$

→ Divide this by two to calculate if the program were 50% successful

→ Multiply this number by \$175

→ Subtract the cost of the pilot program