IndyGo Paratransit Operational Analysis Study

Service Delivery Options - Task 4
Fiscal Impacts - Task 5

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Final Report on Tasks

Prepared for IndyGo

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Service Delivery Options (Task 4) and Fiscal Impacts (Task 5) Report *Final Task Report*

SUMMARY OF REPORT

This report documents the work performed for Tasks 4 and 5 of the *Paratransit Operational Analysis* for IndyGo. Task 4 builds on the preliminary options for IndyGo's ADA paratransit service as presented in the Tasks 2 and 3 Report, focusing on the service delivery options for ADA paratransit. Task 5 estimates operating costs for the options for a five-year period of time. Considerations for the same-day service for ADA riders are also identified, including possible revisions to the dialysis and lottery taxi voucher programs.

Alternatives for ADA Paratransit

Four alternatives for IndyGo's ADA paratransit service have been developed and are presented, along with estimates of trips (ridership) and operating costs, for a five-year period—2021 to 2025.

As requested by IndyGo's RFP for the study, the options include alternatives that reduce the current countywide service area to focus on the area required by the ADA:

- **Alternative #1: Status Quo**
- **Alternative #2: Required ADA Paratransit Only**
- **Alternative #3: Required ADA Paratransit and Grandfathered Service**
- **Alternative #4: Required ADA and Non-ADA Paratransit Service**

Estimates of trips and operating costs build on detailed analyses of actual operational data in Trapeze for a baseline year (2018). Three key factors are used to determine estimates for the five years:

(1) Estimates predicting growth in the number of ADA riders;

(2) Estimates of the number of trips taken by ADA riders annually, differentiated by whether the riders live inside or outside the required ADA service area; and

(3) Service productivity, measuring the effectiveness and efficiency of Open Door scheduling and resulting service on the street (the number of passenger trips carried each revenue hour); this factor has a significant role in the five-year estimates, determining the cost per passenger trip that is then used to estimate annual operating costs.

Comparison of Ridership and Operating Costs

Alternative #1, the Status Quo, shows the highest estimates of ridership compared to the other alternatives. Alternative #1 also shows the highest estimate of operating costs, along with Alternative #4.

Alternative #2, Required ADA Paratransit Only, shows lower estimates of ridership and costs compared to the others, as riders can travel only within the required ADA service area.

Alternatives #3 and #4 provide options for travel outside the required ADA service area. For **Alternative #3, Required ADA Paratransit and Grandfathered Service,** only riders living outside the required area can continue to take trips with one or both ends outside the required area through a grandfathering arrangement. However, Alternative #3 limits this ability to those riders living outside at the time the option is implemented.

Alternative #4, Required ADA and Non-ADA Paratransit Service Areas, allows riders to take trips with one or both ends outside the required ADA area, but those trips have a higher fare in recognition that they are premium trips—not required by ADA regulations. Establishing the fare is an IndyGo policy decision; for purpose of the analysis, we have assumed a doubling of the ADA fare ($3.50 to $7.00). The higher fare decreases trip demand. With fewer trips outside the ADA area, the productivity decreases, which in turn increases the cost per trip and impacts the cost estimates.

Advantages and Challenges

Advantages and challenges vary by alternative. An advantage of **Alternative #1, the Status Quo**, is that it requires no change from current service. However, a primary disadvantage is that it commits IndyGo to continuing increases in ADA paratransit demand and cost that result from service beyond what the ADA requires.

Alternative #2, Required ADA Paratransit Only, which pulls back the service to what the ADA requires, has two primary advantages: It limits the increase in demand and cost to the service that is required. And it allows IndyGo and its contractor to focus achievement of ADA's mandated high service quality standards in the required service area, rather than countywide. Disadvantages of the alternative relate to loss of service for ADA riders with trip origins or destinations outside the required area, and the perception of inequality, given that IndyGo is launching new fixed route transit service with its BRT lines.

Advantages of **Alternatives #3, Required ADA Paratransit and Grandfathered Service,** and **#4, ADA and Non-ADA Paratransit Service Areas**, relate to their provision of some service beyond what the ADA requires. Alternative #3 also has an advantage in that it eventually results in the required ADA paratransit service as the number of grandfathered riders decreases over time. And an advantage of Alternative #4 is the provision of policy levers to IndyGo to address increasing demand and cost in the non-ADA service area.

Alternative #3's disadvantages include that it limits continued ADA paratransit service outside the required ADA area only to those currently eligible and does not significantly reduce demand or cost in the short run.

Alternative #4's disadvantage is differing service policies for those with trip origins and destinations outside the required area, since IndyGo can charge a higher fare and make other policy changes for trips in the non-ADA area to manage demand and cost. Another disadvantage is that demand and cost continue to increase from ADA paratransit service that is not required.

Same-Day Service

Same-day service is not required by the ADA. However, IndyGo has provided some same-day service through taxi vouchers since 2008, and same-day service is available to ADA riders through IndyGo's fixed route service for those who can use accessible fixed route.

Considerations for possible revisions to the current taxi vouchers for dialysis riders and for the lottery program are provided.

Use of transportation network companies (TNCs) is also an option to provide same-day service for ADA riders. Use of TNCs would need assurances that the service provided meets ADA and Title VI requirements for riders who need accessible vehicles and for those who are unbanked and/or do not have a smartphone. The study's Open Door Rider Survey found that 42% of riders do not have a smartphone. Possible involvement of TNCS is being explored by IndyGo on a track separate from this study.

SERVICE DELIVERY ALTERNATIVES FOR NEXT-DAY ADA PARATRANSIT

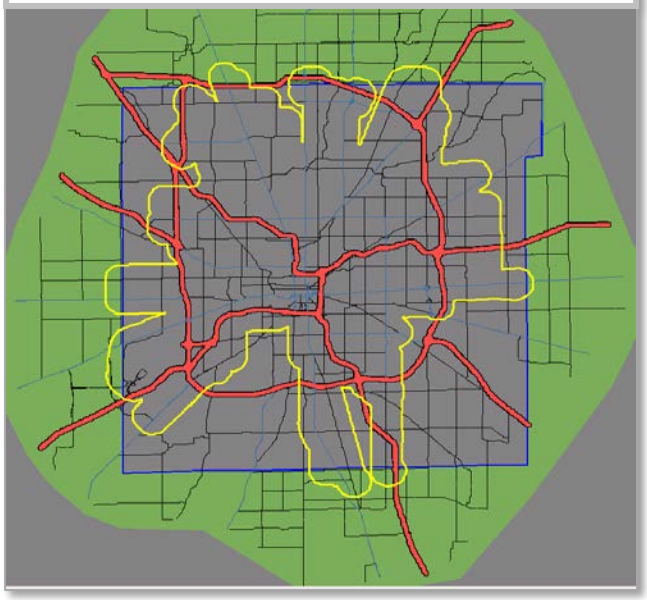
Four alternatives for providing next-day paratransit service are identified and then described below:

#1: Continue to provide ADA paratransit service countywide—the **Status Quo.**

#2: Provide ADA paratransit service only in the required ADA paratransit service area—**Required ADA Service Only.**

#3: Provide required ADA paratransit service in the required area, as in the second option, but continue to serve all currently ADA eligible riders who live outside the required area, providing their trips to destinations both inside and outside the required area through a "grandfathering" arrangement—**Required ADA and Grandfathered Service**.

Open Door now provides service countywide, exceeding the required ADA service area (outlined in yellow) by almost 50%.



#4: Continue to provide paratransit service countywide, but separate the county into two areas—the required ADA service area and the rest of the county. In the latter non-ADA area, different service policies can be adopted, such as a fare higher than in the ADA area, since service beyond the ADA required area is a premium service and does not have to meet ADA requirements—**Required ADA and Non-ADA Service**.

Note that a possible fifth alternative—a hybrid of Alternatives #3 and #4—was mentioned in early discussions with the Mobility Advisory Committee (MAC) regarding the four alternatives developed through the study. However, the parameters of a possible fifth alternative were not discussed in sufficient detail to allow for inclusion in the study and comparison with the other alternatives.

Alternative #1: Status Quo

This alternative would continue Open Door service as now operated. The service area would remain the entire county, as well as small parts of neighboring counties currently served, which is referred to as countywide service for purposes of the study. This is an area of about 400 square miles that exceeds the required ADA area by almost 50%.

Critical to maintaining the status quo is ensuring Open Door performance meets the high performance levels required by the ADA—throughout the entire countywide service area. Service beyond what the ADA requires is referred to as premium service, and the Federal Transit Administration (FTA) cautions that providing premium service should not adversely impact the ADA service that is required by law.

Premium Service: Exceeding Minimum ADA Requirements:

"It is important to ensure that providing premium service does not lead to lower service quality for riders using the regular complementary paratransit service. For example, providing trips beyond the minimum service area is inadvisable if doing so might limit the service quality for trips within the 3/4-mile service area."

FTA Circular 34710.1 Americans with Disabilities Act (ADA) Guidance,
Federal Transit Administration, 11-4-2015.

Advantages

- IndyGo does not have to make any significant policy or operational changes to current Open Door service.

- Advantages for the disability community include:
  - Currently eligible ADA riders can continue to use Open Door as they do now.
  - Individuals with disabilities who move to Marion County in the future can apply for ADA paratransit eligibility and, if certified, can use Open Door.

Challenges

- IndyGo will experience increasing demand and costs to provide ADA paratransit countywide, in part from expected ridership demand in the future as well as normal cost increases for operations (e.g., labor, fuel, etc.). Some of these increases will result from service that IndyGo is not obligated to provide. IndyGo has not seen the large ADA paratransit demand increases experienced in many larger urban areas, but demand has increased. Data for the five-year period 2013 to 2018 show that ridership on Open Door increased 11.1%. Ridership on Open Door plus trips through the taxi vouchers increased 13.3% over the same five years. Since the ADA disallows any capacity constraints, the transit agency is required to increase capacity to meet all demand—now and into the future.

- IndyGo will forgo an opportunity provided through this current study to realign its ADA paratransit service, which currently exceeds what the ADA requires. Study findings provide alternatives along with cost and demand estimates that suggest changes that will help slow increases in demand and cost for ADA paratransit.

Alternative #2: Required ADA Service Only

A second alternative is to provide paratransit service at the level required by the ADA. This includes 3/4-quarter mile corridors around fixed routes, with service provided during the same days and hours as the fixed routes.

With this option, ADA riders can travel on Open Door to and from destinations within the ADA service area but not to destinations outside and only within the operating days/hours of the fixed routes.

Current operating hours for Open Door match the earliest fixed route start time and latest fixed route end time: weekdays, 4:07 a.m. – 1:05 a.m.; Saturdays, 5:26 a.m. – 1:13 a.m.; and Sundays, 6:09 a.m. – 10:05 p.m. The ADA, however, allows IndyGo to match ADA paratransit service to the hours of specific fixed routes. For example, if a certain route ends at 10 p.m. but another route ends at 1 a.m., paratransit service in the corridor of the first route would end at 10 p.m., while paratransit service in the corridor of the second route would end at 1 a.m. It is not currently operationally feasible to do this because paratransit service operates in areas with no fixed route service.

It's important state that ADA eligible riders who live outside the ADA area continue to be ADA eligible, and they can use ADA paratransit as long as their trip origins and destinations are inside the ADA service area.

It's also important to note that individuals with disabilities who move to Marion County in the future but to homes outside the ADA area can apply for ADA paratransit eligibility and, if determined eligible and certified, can use Open Door as long as their trip origins and destinations are inside the ADA service area.

Advantages

- This alternative pulls back IndyGo's paratransit service to what the agency is required to do by federal law. With projections of increasing ADA paratransit demand and accompanying cost implications, the transit agency would no longer provide transportation beyond the ADA service area—service that the FTA refers to as premium service. The FTA fully recognizes that such service is beyond what is mandated and that it is a decision at the local level to provide any premium service.

- This alternative would allow the contractor to focus on achieving required ADA performance levels in the required area. There is no federal requirement to meet the ADA required service criteria (e.g., meet all trip demand and purposes, ensure no capacity constraints, etc.) for trips that begin or end outside the service area. However, the current countywide service—with trips inside and outside the required ADA area—is commingled, and it would not be operationally feasible to separate day-to-day performance between the two with one provider.

Challenges

- Currently eligible ADA riders with trip origins and/or destinations outside the required ADA area would no longer have Open Door service for those trips.

- Improving IndyGo's fixed route service—new BRT service with the opening of the Red Line and plans for two additional BRT lines—at the same time as reducing current paratransit service for people with disabilities may be perceived as inequitable.

Alternative #3: Required ADA Service and Grandfathered Service

With this option, IndyGo would provide ADA service in the required area as in Alternative #2 with exceptions only for currently eligible ADA riders who live outside the required ADA service area. These ADA riders could continue using ADA paratransit, with trips to destinations both inside and outside the required ADA service area, through a *grandfather* arrangement. This arrangement continues for the grandfathered riders until they move from their residence at the time the option was implemented, required service more specialized than ADA paratransit, or passed away. Data shows that 11% of ADA eligible riders have a trip origin/home address outside the ADA service area.

For purposes of this study, it is assumed that the fare for the grandfathered riders is the same as the regular Open Door fare.

Advantages

- Currently eligible ADA riders living outside the required ADA service area would continue to receive Open Door service as they do now. There is no change for those current ADA riders as long as they remain at the home address when the alternative was implemented.

- Alternative #3 will eventually result in Alternative #2, Required ADA Paratransit Service Only,

Challenges

- Demand and cost for ADA paratransit will not decrease significantly in the short term. It is unknown how long it will take for the attrition of the grandfathered riders to end the grandfathered service, but most likely more than the five-year horizon of the cost estimates provided in this study.

- Through attrition, the demand density of trips in the non-ADA area will decrease, which will impact productivity and increase the cost per trip for the trips of the grandfathered riders.

Alternative #4: Required ADA and Non-ADA Service Areas

This alternative envisions a bifurcated service area: the ADA required area, defined by the 3/4-mile corridors around fixed route service; and the remaining portion of the current service area, termed the non-ADA area for purposes of the study.

The option maintains service for ADA eligible riders living outside the ADA area, and it will continue to allow new individuals with disabilities to apply for ADA paratransit eligibility and use the service if certified. However, since service outside the ADA area is not required by the ADA, IndyGo can adopt differing policies, such as a higher fare and fewer service hours.

For purposes of the analysis, we have assumed a fare of $7 per one-way trip for trips with one or both ends outside the required ADA service area, which is twice that of the Open Door fare of $3.50. Setting fares is a policy determination by IndyGo. However, to develop cost estimates, we chose $7 as a placeholder fare. The higher fare will result in a somewhat reduced level of trip demand. It will also increase the farebox recovery and help offset operating costs. Attachment A provides a number of examples of other transit agencies that have both an ADA and non-ADA service area and the different fares that are charged.

Advantages

- This option formally recognizes that IndyGo provides premium service by setting a higher fare for trips that are not required by the ADA.
- The option gives IndyGo policy levers to adjust or limit the premium service over time depending on increasing paratransit costs, declining performance that jeopardizes ADA compliance, or other changes impacting paratransit that are unknown at this time. If, for example, Open Door experienced a major increase in ADA eligible and active riders, the transit agency could raise the fare for the premium service to manage demand. IndyGo could also reduce the operating hours or establish trip priorities in the non-ADA area.
- Currently eligible ADA riders continue to have access to Open Door service.
- Individuals with disabilities moving to Marion County in the future can apply for ADA paratransit eligibility and, if determined eligible and certified, can use Open Door.

Challenges

- Demand and cost continue to increase from paratransit service not required by the ADA.
- ADA riders with trips outside the ADA required area will face a higher fare.
- ADA riders may face other policy differences in future years should IndyGo revise policies for service in the non-ADA area to manage demand and costs. For example,

IndyGo could reduce service hours for Open Door trips in the non-ADA service area compared to service hours in the required area.

RIDERSHIP AND COST ESTIMATES FOR ADA PARATRANSIT ALTERNATIVES

Ridership and cost estimates for Alternatives #1 through #4 are provided in Tables 1 to 4. Attachment B to the report details the development of the estimates.

The estimated costs are provided for a five-year period. The first year of the time period is 2021. The baseline data for these estimates are known costs and Open Door operating data from 2018, which was chosen as the most recent year without a large number of trips shifted to taxi vouchers. Estimates are projected from the baseline data. For purposes of the study, we have used active riders, defined as those who took more than two trips in 2018. We used this definition so as to not count the casual rider who may only have traveled on Open Door twice—to and from the in-person eligibility certification interview.

Estimating costs for a five-year period for Open Door assumes no major changes to or new interpretations of the ADA law that would necessitate significant service or structural changes to meet ADA regulations.

There are also various uncertainties about the future that could impact demand for ADA paratransit, with corresponding impacts on costs for the service. Such uncertainties include, among others, revisions to federal requirements regarding Medicaid non-emergency medical transportation (NEMT). These uncertainties are discussed later in this report.

In addition, it is important to understand that development of cost estimates for the four ADA paratransit alternatives uses several factors that greatly impact the resulting estimates. These factors include estimates of: (1) the number of active ADA riders; (2) the number of trips by active rider; and (3) the productivity of the ADA paratransit service. A change to one, two or three of these factors will impact the resulting cost estimates. These factors and their role in the cost estimation process are described.

Table 1: Alternative #1 - Status Quo

	2021	2022	2023	2024	2025
Estimated Number of Active Riders	2,832	2,906	2,981	3,059	3,138
Estimated Total Trips	317,209	325,456	333,918	342,600	351,507
Total Estimated Cost	**$11,095,000**	**$11,623,000**	**$12,164,000**	**$12,730,000**	**$13,322,000**

Table 2: Alternative #2 - ADA Only

	2021	2022	2023	2024	2025
Estimated Number of Active Riders	2,832	2,906	2,981	3,059	3,138
Estimated Total Trips	266,229	273,151	280,253	287,539	295,015
Total Estimated Cost	**$9,085,000**	**$9,517,000**	**$9,960,000**	**$10,424,000**	**$10,908,000**

Table 3: Alternative #3 - ADA and Grandfathered Service

	2021		2022		2023		2024		2025	
	ADA	GFs	ADA	GFs	ADA	GFs	ADA	GFs	ADA	GFs
Estimated Number of Active Riders	2,525	308	2,590	301	2,658	295	2,727	290	2,798	284
Estimated Total Trips	270,133	32,915	277,156	32,257	284,362	31,611	291,756	30,979	299,341	30,360
Total Estimated Cost	**$11,100,000**		**$11,538,000**		**$11,986,000**		**$12,475,000**		**$12,986,000**	

Table 4: Alternative #4 - ADA and Non-ADA Service Areas

	2021		2022		2023		2024		2025	
	ADA Riders									
	Inside	Outside	Inside	Outside	Inside	Outside	Inside	Outside	Inside	Outside
Estimated Number of Active Riders	2,525	308	2,590	316	2,658	324	2,727	332	2,798	341
Estimated Number of Trips by Riders Inside vs. Outside	272,657	26,763	279,746	27,458	287,020	28,172	294,482	28,905	302,139	29,656
Total Estimated Trips	299,420		307,205		315,192		323,387		331,795	
Total Estimated Cost	**$11,171,000**		**$11,703,000**		**$12,247,000**		**$12,817,000**		**$13,413,000**	

Key Factors in Developing Cost Estimates for ADA Alternatives

(1) Number of Active Riders

The number of active riders used for costing the ADA alternatives started with the number of active riders in 2018. This year was chosen as the baseline year as it represents an operational year without significant numbers of riders and trips removed through the taxi voucher program for subscription riders.

To get to year one of the five-year cost estimates—2021—we assumed there would be more ADA riders than in 2018, given population growth. The growth rate we have used is the compounded annual growth rate of the disabled population in Marion County over the period 2012-2017, from the U.S. Census, American Community Survey. This rate—computed as 2.6%—is then used to develop the numbers of active riders for 2021 through 2025 from the baseline year.

If the growth rate is more or less than what we have assumed, it will mean more or less ADA riders in the future. If, for example, the growth rate is 2.0%, then the estimated number of ADA riders in 2021 will be 2,783 rather than 2,832. While the difference is small (49 riders), it will reduce the total number of annual trips when the number of active riders is multiplied by the trip rate. This then will somewhat reduce the total estimated costs for the alternative.

For Alternative # 3—ADA and Grandfathering—we have assumed a small decline (2%) in the number of grandfathered riders starting in the second year of the five-year time horizon of the estimates.

(2) Annual Number of Trips per Active Rider

The number of annual trips taken by ADA active riders is important as it is used to estimate total annual trip demand. Again using data from the baseline year of 2018, we determined the annual number of trips by active rider. This was differentiated by those with a trip origin/ home address inside versus outside the required ADA service area, accomplished with detailed analyses of Trapeze data from the baseline year. The resulting trip rates were then used to estimate total annual trips for the four ADA alternatives.

Similarly to a change in the number of active riders, a change in the number of trips per rider will impact the total costs we have estimated for the alternatives. For example, the Required ADA Only alternative uses an annual trip rate of 94. A rate higher or lower will change the total number of annual trips. Using the estimated 2,832 ADA riders for 2021, a trip rate of 99 will give a total of 280,368 trips, a number that is 5% more than what is estimated using the trip rate of 94. Such higher numbers will increase the resulting annual costs for the trips.

(3) Productivity

Productivity measures the number of passenger trips carried each revenue hour. We use productivity to compute the cost for an individual passenger trip, based on the Open Door provider's information on cost per revenue hour submitted with its bid. A simple example shows the importance of this factor.

Assume a transit agency has a provider that costs $50 per revenue hour. If the provider serves 1.8 trips each hour, the cost per trip is $27.78 ($50/1.8). If the provider serves fewer trips per hour, say 1.5, then the cost per trip increases to $33.33. Alternatively, if the provider can increase productivity to 2.0, the cost per trip decreases from $27.78 to $25.00 ($50/2.0) per trip.

Even small changes in productivity can have a significant impact on total estimated operating costs, as the cost per trip is multiplied by thousands of trips. Compare the productivity of 1.7 versus 1.65 with the same provider costing $50 per revenue hour: a cost per trip of $29.41 vs. $30.30.

Development of the operating cost estimates for the four ADA alternatives uses productivity figures that have been determined from detailed analyses of sampled Trapeze data from the baseline year. The productivity figures used for the estimation process have a significant role in the resulting figures.

Note that the productivity data we have used is for eligible riders and do not include PCAs or companions. When transit agencies examine their overall productivity, PCAs and companions are typically included, which serves to increase the productivity figures somewhat. Including PCAs and companions with counts of eligible riders is also what is reported for the National Transit Database (NTD). However, given that we have used actual Trapeze data on paratransit trips rather than total passengers to calculate productivity for the ADA alternatives, PCAs and companions are not included. Such additional riders make up about 3-5% of total Open Door ridership, according to a review of Open Door data.

Trapeze Data Analyses

The analyses were completed using IndyGo's Trapeze v12 software, including the Schedule Administrator module for managing daily schedules, the Batch Scheduling tool which allows for different solutions parameters and violation settings to be applied depending on the specific requirements of the batch, and the geographic analysis module PLAN, which compares addresses' longitude and latitude to determine whether an address is inside or outside defined polygons (in this case, the ADA Service Area polygon). With these tools, various analyses were conducted from representative actual scheduled and operational data from the baseline year to structure trips for the 4 alternatives and determine the productivity figures to use to estimate costs. As appropriate, adjustments were made for the estimated increase in trip volume from the baseline year to 2021. Important for Alternatives #3 and #4 were separate calculations for trips with one or both ends outside the ADA polygon to account for lowered demand densities that in turn lower productivity and increase cost per trip. More details are provided in Attachment B, Development of ADA Paratransit Alternatives

Summary of Estimates for the ADA Paratransit Alternatives

A summary of the ridership and operating cost estimates for the four ADA paratransit alternatives is provided in Table 5.

Table 5: Summary of ADA Paratransit Alternatives

		Year				
		2021	**2022**	**2023**	**2024**	**2025**
Alternative #1 Status Quo	Estimated Trips	317,209	325,456	333,918	342,600	351,507
	Estimated Operating Cost	$11,095,000	$11,623,000	$12,164,000	$12,730,000	$13,322,000
Alternative #2 ADA Only	Estimated Trips	266,229	273,151	280,253	287,539	295,015
	Estimated Operating Cost	$9,085,000	$9,517,000	$9,960,000	$10,424,000	$10,908,000
Alternative #3 ADA and Grandfathered Service	Estimated Trips	303,048	309,413	315,974	322,735	329,701
	Estimated Operating Cost	$11,100,000	$11,538,000	$11,986,000	$12,475,000	$12,986,000
Alternative #4 ADA and Non ADA Service Areas	Estimated Trips	299,420	307,205	315,192	323,387	331,795
	Estimated Operating Cost	$11,171,000	$11,703,000	$12,247,000	$12,817,000	$13,413,000

The Status Quo alternative shows the highest estimate of ridership compared to the other alternatives. This alternative, along with Alternative #4, shows the highest estimated operating costs among the alternatives.

Alternative #2, Required ADA Paratransit Only, shows lower estimates of ridership as well as costs compared to the others. Impacting the estimates for this alternative is a slighter higher productivity figure, compared to the Status Quo alternative: all trips have both an origin and destination inside the required ADA service area and are somewhat shorter in length compared to the Status Quo, which will improve productivity.

We note, however, that we found that the productivity increase determined through the Trapeze data analysis for Alternative #2 compared to #1 was less than anticipated. This is explained, at least in part, by the exclusion of trips that are near but outside the border of the ADA service area; inclusion of these trips in the Status Quo alternative provides an increased opportunity for shared rides, benefitting productivity.

Also important to note for this alternative is the fact that ADA eligible riders living outside the ADA service area can continue to take trips as long as they can get into the required ADA service area. The Trapeze analyses show that currently about 8% of Open Door trips taken by

ADA riders who live outside the service area have both an origin and destination inside the ADA service area.

Alternative #3, Required ADA and Grandfathered Service, estimates fewer trips than the Status Quo alternative since ADA riders living inside the required ADA service area can travel only inside that area. Unlike Alternative #2 ADA Only, Alternative #3 allows ADA riders presently living outside the required service area to continue using Open Door for trips with an origin and/or destination outside the required area through a grandfathering arrangement. The estimates assume that the number of grandfathered riders will decrease slowly over time. With fewer trips originating beyond the ADA service area over time, the productivity of those trips will also decrease. This serves to increase the cost per trip for those trips, impacting the cost estimate.

Alternative #4, Required ADA and Non-ADA Service, also shows an estimated ridership lower than the Status Quo alternative, as trips with one or both ends outside the required ADA area have a higher fare, which serves to decrease demand for trips. The lowered demand density impacts productivity of trips in the non-ADA area, which in turn increases cost per trip so that estimated annual costs are just slightly above that estimated for Alternative #1. The higher farebox recovery for trips to and from the Non-ADA Service area will somewhat offset the operating costs. Estimated costs are also higher than Alternative #3 since the number of active riders continues to grow over time, which is not the case for Alternative #3 where the estimate of grandfathered riders decreases over time. However, Alternative #4 gives IndyGo leverage to make changes to address operating costs on an ongoing basis. Since service in the non-ADA area is not required by the ADA law, IndyGo can increase fares, reduce operating hours, and/or establish trip priorities—policy changes which would decrease demand and lower operating costs.

Outreach to the Disability Community Regarding Possible Changes to Open Door

The ADA requires that transit agencies have a mechanism for ongoing participation with individuals with disabilities related to services for people with disabilities, specifically including ADA paratransit. Outreach to the disability community is particularly important when a transit agency contemplates changes to ADA paratransit service.

This paratransit study has included outreach to stakeholders and the disability community in the Indianapolis area during the study through various activities (as described in the Public Outreach Report, Draft). We note two recent efforts (in late February 2020): two invited stakeholder meetings with Marion County agencies with large numbers of clients using Open Door to discuss the ADA alternatives in this report. Outcomes and feedback from the meetings will be included in the Public Outreach Report.

IndyGo plans additional outreach to the disability community about the study's findings, including alternatives for Open Door, beyond the activities conducted during the study.

UNCERTAINTIES AFFECTING DEMAND AND COST ESTIMATES

Forecasting the estimated demand and costs for ADA paratransit faces a number of uncertainties that affect such predictions.

- Continuing changes to Medicaid's non-emergency medical transportation (NEMT) program could impact demand for ADA paratransit. As discussed in the study's Task 1 Report, the state of Indiana has already set some limits on NEMT in the state, including a cap on the number of NEMT trips a beneficiary can take unless there is prior authorization. The state has also disallowed transportation for Medicaid beneficiaries with incomes over a certain defined level.

  Additional restrictions on Medicaid NEMT in the state could result if the current administration makes Medicaid transportation optional for states, as has been discussed. To the extent Medicaid beneficiaries have disabilities and ADA eligibility, they may turn to Open Door for trips previously provided through Medicaid, increasing paratransit demand.

  On the other hand, should Medicaid managed care organizations (MCOs) adopt free transportation programs using TNCs such as through UberHealth and Lyft Concierge (various MCOs are piloting services with TNCs), this could reduce any shifting of Medicaid-eligible trips currently to Open Door or in the future. The result could potentially decrease demand for ADA paratransit.

- Demand for service for the option that restricts ADA service to the required service area may be impacted by ADA riders who live outside the required area and come inside with trip requests. ADA eligibility is not tied to where one lives in relation to an ADA service area. A person with a disability who lives beyond the ADA area can still become ADA eligible, and, as long as that person can get inside the ADA area, that person has a civil right to the available ADA service.

  With Open Door data for the baseline year and information on the origin/home address of ADA eligible riders, we have data to calculate the number of trips inside the service area currently taken by ADA riders living outside and have used these data for costing the ADA alternatives, as appropriate. However, we do not know the extent to which this will continue in the future, or if trip-making patterns of those riders will change in future years, which would impact future trip demand and costs.

- Should Open Door performance achieve the standards set in the contract for timeliness at both the origin and destination locations—95%—on a consistent basis, demand for trips, and therefore costs, will increase.[1] Experience in the industry has shown that on-time performance is a significant factor correlated with demand.

[1] IndyGo has just recently revised the on-time performance standard for the contractor to 93%. This remains a high level of performance.

- If the lottery voucher program is limited so that fewer trips are available, it is likely that some trip demand will revert to Open Door. Since same-day service induces demand, it is likely that only some portion of the lottery trips would come back to Open Door. There is insufficient data and experience to estimate what that increase might be.

- Should IndyGo implement comprehensive conditional eligibility through the eligibility determination process and couple that with effective trip-by-trip scheduling, some ADA riders will use fixed route rather than Open Door for some of their trips. This will have the effect of mitigating an increase in demand for ADA paratransit. While there is limited data on the results of the use of trip-by-trip scheduling for conditionally eligible riders, what there is suggests that those riders take trips on ADA paratransit at about half the rate of unconditionally eligible riders.

- Increasing numbers of seniors are assumed to result in an increase in demand for ADA paratransit, since people age 65 and older have higher rates of disability than younger age cohorts. However, not all disabilities impact an individual's ability to use fixed route, which must be considered for ADA eligibility. Thus there is uncertainty as to the extent to which increasing number of seniors will lead to increasing demand for ADA paratransit.

  Research on rates of disability among seniors has shown that disability is not an inevitable part of aging. One study found that the prevalence of physical disability in seniors decreased from 26% to 20% between 1982 and 1999. This was a positive trend, but the study notes that such decrease may not be sustained given increasing rates of obesity and other factors impacting health in the U.S. Individuals who are overweight and obese are at increased risk for chronic diseases such as diabetes and heart disease as well as osteoarthritis and other diseases that affect mobility. Continuing research is looking at new treatments and interventions to prevent disability in seniors, and adoption of healthier lifestyles among older people may help decrease disability.[2] The net result is that it is not known the degree to which increasing numbers of seniors will result in increasing numbers of ADA eligible individuals or the degree to which they will become active riders.

- Continuing community integration for people with developmental disabilities is likely to increase demand for ADA paratransit, as discussed in the Tasks 2 and 3 Report. Better integration includes opportunities for employment in the community as well as small group living arrangements. The impacts on transportation mean fewer group trips—"many-to-one" trips and more individualized trips to various different locations ("few-to-one" and "one-to-one" trips). The more limited opportunities for group trips with shared riding will increase demand and costs for ADA paratransit.

[2] National Institutes of Health, U.S. Department of Health and Human Services, Disability in Older Adults-Fact Sheet at https://report.nih.gov/nihfactsheets/viewfactsheet.aspx?csid=37

SAME-DAY SERVICE

Same-day service is not required by the ADA. However, IndyGo has provided some same-day service through taxi vouchers since 2008, and same-day service is available through IndyGo's fixed route service for those who can use accessible fixed route.

Early discussions with IndyGo staff indicate there is interest in keeping the dialysis voucher program with possible changes that recognize that it is premium service as well as interest in providing some basic but limited amount of same-day trips for ADA riders.

More significant changes to same-day service might involve some types of TNC service (e.g., Uber, Lyft) but this would require major changes to the current same-day service and special efforts to ensure compliance with ADA regulations and with Title VI, as described in the Tasks 2 and 3 Report.

Considerations for providing same-day service are outlined below.

Accessible Fixed Route

IndyGo's fixed route service is accessible to those with disabilities. All fixed route vehicles are accessible and increasing numbers of bus stops are accessible. As discussed in the Tasks 2 and 3 Report, IndyGo's has plans to upgrade almost 200 stops that will include ADA accessibility improvements and, in some cases, may include the provision of connecting sidewalks as well.

Riders who are ADA eligible have been able to use fixed route for free. Revisions to the fare structure have proposed that ADA riders pay half fare for fixed route.

This study recommends that ADA riders who are conditionally eligible—which by definition means they can use fixed route some of the time or for some of their trips—ride for free. This will encourage them to use fixed route rather than ADA paratransit when fixed route service is an option for their trips and, as a result, avoids more costly paratransit trips.

Same-Day Service through Open Door on Space-Available Basis

Another possible option for same-day service is to allow ADA riders to request same-day trips on Open Door on a space-available basis. Some transit agencies have such a policy, and the policy may define the types of trips eligible for same-day service. For example, the policy may allow same-day trips only as "will-call" trips after medical appointments, which often run past their scheduled time and can cause operational difficulties for ADA providers.

Or the policy may have other restrictions, and they may require a higher fare and typically a longer on-time window. One transit agency with same-day trips for ADA riders clearly informs riders that such trips are very limited on weekdays and essentially only an option on weekend days when demand is lower.

Should IndyGo consider allowing same-day trips through Open Door, it will be important to first ensure that the next-day service meets the high performance level required by the ADA on a sustained basis.

Dialysis Voucher Program

IndyGo's subsidized taxi program for dialysis riders currently serves about 50 individuals. One taxi company has been providing the dialysis trips, but has no accessible taxi vehicles. IndyGo has indicated that policy changes to the program should be considered. In addition, the dialysis program requires changes to ensure it's compliant with the ADA and with FTA's requirements regarding drug and alcohol testing for safety sensitive staff.

Revisions to Ensure Compliance with Federal Requirements

Two revisions to the program should be made to ensure the program meets ADA equivalency requirements and to mitigate the requirement for the current taxi company to meet FTA's drug and alcohol testing requirements. As explained in the Tasks 2 and 3 Report, the program must provide service for dialysis riders who use wheelchairs and, unless a second taxi company is involved as a provider, the current company is considered to "stand in the shoes" of the transit agency and must meet FTA's drug and alcohol testing requirements.

The most straightforward way to address both issues is to include Yellow Taxi as a provider for the dialysis trips. Yellow Taxi has accessible vehicles and with two taxi companies involved as providers, the program meets FTA's "taxicab exception." When riders have two or more taxi companies to choose from, the FTA has determined that the drug and alcohol testing requirements do not apply.

Policy Revisions for the Dialysis Voucher Program

Providing taxi trips for dialysis riders helps ensures those individuals receive the life-sustaining treatment they need and also mitigates operational issues in serving the trips, which often require re-scheduling and more individualized attention due to the riders' frail status after treatment. However, given that the service is a premium service not required by the ADA, policy revisions can be considered.

Sampled dialysis voucher and taxi company data were analyzed to better understand current use patterns and to develop considerations for revisions.

Provide Service for Dialysis Riders Using Wheelchairs

Revising the dialysis voucher program assumes an increase in the number of eligible riders to ensure that riders using wheelchairs are also served. Sample data for October 2019 show a total of 47 dialysis riders using the taxi vouchers. We have increased the number eligible for

service to 60 to estimate the addition of riders using wheelchairs. This assumes that about 20% of dialysis riders use wheelchairs.[3]

Increase the Fare to Recognize the Premium Nature of the Service

The current fare/cost per voucher is the same as the ADA fare of $3.50. We suggest that this be increased, recognizing the premium status of the program. The fare might also be differentiated by the length of the trip, which may encourage riders to use dialysis centers closer to their home location.

Number of Trips per Eligible Rider and Trip Length

The program should continue to allow riders to purchase as many vouchers per month as needed for their dialysis treatment. With three treatments per week, this may require six one-way trips per week and then 24 to 26 or even 28 trips per month depending on the numbers of days in the month. However, based on the sampled data, not all eligible riders use vouchers for all their dialysis trips. Some have other means of transportation for some of their dialysis trips and use taxi vouchers for only a portion of their trips for treatment.

Data for the sampled month of October 2019 show that the average number of trips per month taken by dialysis voucher riders is 22. Average trip length is 7.65 miles.[4]

Reimbursement to the Taxi Companies

Currently, the taxi companies are paid $26.50 per dialysis trip, regardless of length. Based on the taxi company's current fare structure, a fare of $26.50 will provide a trip of approximately 10 to 11 miles. This is approximate because it is based on the pick-up charge and per mile charge but not any waiting time charges.

The sampled trip data show that 27 of the 47 trips (57%) are shorter than 7.65 miles, with an average of 4.4 miles. Only three of these trips are six or more miles in distance. This suggests that the taxi company profits from these trips, given the higher reimbursement compared to estimated meter charges. Based on the taxi meter charge, a trip of 4.4 miles would cost approximately $13 (without a calculation for waiting time charges).

Based on the sampled data, the remaining trips are eight miles or longer, with ten trips longer than 11 miles. One trip is almost 23 miles in length. The average is 12.1 miles. Based on the taxi

[3] Research shows that that "over one-third of patients on dialysis use wheelchairs or walkers," according to *High Cost of Dialysis Transportation in the United States*, by J. M, Stephens, et al., in Journal of Health Economics and Outcomes Research, August 2013. While the study does not `differentiate between wheelchairs and walkers, for purposes of this study for IndyGo, we assume that 20% of dialysis riders use wheelchairs.

[4] Of the 47 riders, five used two different dialysis centers in the sampled month. We used the longer of the two trip distances for these riders when computing the average trip distance.

meter charge, a trip of 12.1 miles would cost approximately $27.45 (without a calculation for waiting time charges). It is likely that reimbursement to the taxi company for trips longer than 10-11 miles is less than what would be the meter charge.

Suggested Changes

The following changes to the program can be considered:

- Provide for two types of vouchers, differentiated by the trip distance between the rider's origin and dialysis center location: trips up to eight miles, and trips longer than eight miles. (Note that the average ADA trip length for trips with both origin and destination inside the required ADA service area is 7.6 miles.) An ADA rider interested in the dialysis voucher program would indicate the one-way distance between their home and dialysis center location when applying to the program.

- For the shorter dialysis trips, reimburse the taxi companies a flat $20; for the longer trips, reimburse the taxi companies a flat $32. While a mileage-based fare tied to the taxi meter would be more cost-effective, it would be harder to administer given the current technology used. Also, use of a flat rate seems to have encouraged the current taxi company and their drivers to provide the dialysis trips.

- For trips that require an accessible vehicle, provide an additional $5 to account for the extra time needed to serve trips for riders using wheelchairs. Require the taxi companies to provide the $5 directly to the taxi driver.

- Costs of the vouchers to the riders are $7 for trips shorter than 8 miles and $9 for trips longer than 8 miles. Establishing the voucher cost for riders is a policy decision for IndyGo. We used these figures to demonstrate what the estimated costs might be.

Estimated Costs for a Revised Program

Based on the suggested changes outlined above, the estimated riders, trips, and costs for the dialysis voucher program are provided in Table 6. Such changes suggest an estimate of almost 16,000 annual dialysis trips for a cost to IndyGo of somewhat over $290,000. Changes to assumed numbers of dialysis riders, trips that riders actually take, the cost per voucher for the riders, and the reimbursement rate to the taxi companies will provide different estimates.

Revised Lottery Voucher Program

IndyGo has provided the lottery voucher program since 2008. As described on the transit agency's website, the intent of the program is "to assist in spontaneous travel needs outside of the regular service hours."

Open Doors' regular service hours match those of fixed route, as required by the ADA, which are 4:07 a.m. to 1:05 a.m. on weekdays; 5:26 a.m. to 1:13 a.m. on Saturdays, and 6:09 a.m. to 10:05 p.m. on Sundays. Given the generous span of service, it is not likely there is much trip demand outside of these service hours.

This study provides the opportunity to reconsider the objective of the program, revise the fare structure to recognize its premium status, and consider options more equitable than a lottery, which is based on chance.

Provide All Riders with Small Number of Same-Day Taxi Trips Annually

One option that is more equitable than the current program is to provide all eligible ADA riders with the opportunity to annually purchase a small number of same-day taxi trips. This option gives all riders the chance to purchase a very limited number of same-day trips.

Variations are possible, as shown in Table 7, using the following assumptions:

- A total of 2,832 active riders in the year 2021.[5]
- 20% of the riders need an accessible taxi vehicle. Open Door data show that 22% of trips are for riders who use wheelchairs.
- 80% of eligible riders purchase the vouchers. Based on sampled lottery voucher data, 73% of the lottery voucher booklets were purchased in the sampled period. To be conservative, we rounded this up to 80%.
- Continue the current reimbursement to the taxi companies at $26.50 per trip.
- Provide an additional $5 for each trip provided with an accessible taxi for a rider using a wheelchair. This is an incentive to the driver given that wheelchair trips take longer to serve and the ADA prohibits charging extra for such trips.
- Riders pay $7.00 per voucher.

Changes to the assumptions will change the resulting costs to IndyGo. For example, fewer numbers of accessible trips will lower the cost. Also, a change in the taxi rate structure that increases the pick-up and/or mileage charge may result in taxi drivers less willing to serve the voucher trips if the reimbursement rate is not also increased. Or a change in the way that taxi companies pay their drivers for the trips could also impact drivers' willingness to serve the trips.

Provide Selected Riders a Monthly Allotment of Same-Day Taxi Trips

This option would determine criteria based on policy objectives to subsidize same-day taxi trips for defined ADA riders. Criteria that could be considered include those with low incomes; elderly riders over a defined age; and/or those with specific chronic diseases needing on-going medical trips. For example, Census data for 2017 show that 17.6% of Marion County

[5] This is the estimated number of active riders in 2021 as described earlier in the report.

residents are identified as *persons in poverty*. It is likely that some portion of ADA riders is included in this definition.

IndyGo would establish the criteria depending on its defined policy objectives and develop an application process to determine ADA riders eligible for the same-day trips.

Table 8 depicts variations of this option, with an assumption that 10% of ADA riders estimated for 2021 would be eligible and that 80% of those riders would purchase the vouchers each month.

Provide ADA Riders with a Subsidized Debit Card for Electronic Payment

Another option would use a debit card for taxi payment instead of the current process. IndyGo would determine the amount of funds available to riders and the subsidy level. Riders would provide payment to "load" funds onto the card. Riders would use the subsidy to pay for taxi trips according to meter rates. This gives the rider more responsibility for taxi use compared to vouchers purchased for a set amount for a taxi trip of undetermined length in Marion County. For example, riders might be eligible for a debit card with $60 worth of taxi transportation for a cost of $30. Costs for such a program would include the subsidy amount provided to riders, the number of riders who participate, and administrative costs for the use of the debit card.

Transportation Network Companies

Use of transportation network companies (TNCs) is also an option to provide same-day service for ADA riders. Use of TNCs would need assurances that the service provided meets ADA and Title VI requirements for riders who need accessible vehicles and for those who are unbanked and/or do not have a smartphone. In particular, use of TNCs typically requires that riders have a smartphone. The Open Door rider survey found that more than two-fifths of riders (42%) do not have one.

Possible involvement of TNCS is being explored by IndyGo on a track separate from this study. The transit agency has issued a Request for Information (RFI) to obtain information about the services that TNCs might provide and to assess options.

Table 6: Estimates for Revised Dialysis Voucher Program

	Riders in Sampled Month	Increase for Riders Using Wheelchairs	Voucher Trips/ Month	Voucher Trips Provided	Reimbursement to Taxi Cos.	Extra Payment for Accessible Trips @ $5 (Est. 20% of Trips)	Monthly Cost to IndyGo	Annual Cost to IndyGo	Total
Riders with Trips Less Than 8 Miles	27	34	22	748	$14,960	$748	$10,472	$125,664	$290,400
Riders with Trips 8 Miles and Longer	20	26	22	572	$18,304	$572	$13,728	$164,736	

Table 7: Provide All ADA Riders with Limited Number of Voucher Trips Annually

Variations on Limited Number of Vouchers for ADA Riders	Estimated Eligible Riders, 2021		Voucher Users at 80%		Voucher Trips Provided		Lower Demand Due to Higher Fare		Reimburse Taxi Companies for Trips		Extra Payment for Accessible Trips	Total to Taxi Companies	Rider Fares	Cost to IndyGo
	Ambulatory Riders	Riders Using W/Cs	Ambulatory Riders	Riders Using W/Cs	Ambulatory Trips	Wheelchair Trips	Ambulatory Riders	Riders Using W/Cs	Ambulatory Riders	Riders Using W/Cs				
6 Trips per Rider, all 6 Used	2,266	566	1,812	453	10,875	2,719	--	--	$288,184	$72,046	$13,594	$373,824	$95,155	$278,669
6 Trips per Rider, Decrease Demand by 20% due to Higher Fare	2,266	566	1,812	453	10,875	2,719	8,700	2,175	$230,547	$57,637	$10,875	$299,059	$76,124	$222,935
10 Trips per Rider, all 10 used	2,266	566	1,812	453	18,125	4,531	--	--	$480,307	$120,077	$22,656	$623,040	$158,592	$464,448
10 Trips per Rider, Decrease Demand by 20% due to Higher Fare	2,266	566	1,812	453	18,125	4,531	14,500	3,625	$384,246	$96,061	$18,125	$498,432	$126,874	$371,558

Table 8: Provide Policy-Defined ADA Riders with Voucher Trips Monthly

Variations of Same-Day Trips for Selected Riders	Estimated Qualifying Riders	Ambulatory Riders	Riders Using Wheechairs	Ambulatory Trips	Wheelchair Trips	Voucher Trips Provided	Reimburse Taxi Cos. at $26.50/Trip	Extra Payment for Accessible Trips @ $5	Total to Taxi Cos.	Riders Fares	Monthly Cost to IndyGo	Annual Cost to IndyGo
10% of Riders Qualify for 10 Trips Monthly	283	227	57	1,812	453	2,266	$60,038	$2,266	$62,304	$15,859	$46,445	$557,338
10% of Riders Qualify for 8 Trips Monthly	283	227	57	1,450	362	1,812	$48,031	$1,812	$49,843	$12,687	$37,156	$445,870

Attachment A: Examples of Paratransit Service in Area Beyond the Required ADA Service Area

City and State/ Transit Agency	Service Area Size and Population (From NTD)	Premium Service for ADA Riders	Fare Structure
Zephyr Cove, NV Tahoe Transportation District	73 Square Miles 150,242 Population	Beyond ADA area: communities tangent to the ADA service area, defined as 1 mile corridors of fixed routes.	ADA: $3 Beyond ADA area: $6
Richmond, VA Greater Richmond Transit Company	227 Square Miles 449,572 Population	Beyond ADA area: Trips with an origin or destination outside the required area are available for a higher fare and with more limited service hours than the ADA required service.	ADA: $3 Beyond the ADA area: $6
Monterey, CA Monterey-Salinas Transit	294 Square Mile 435,232 Population	Beyond the ADA area: Limited service is provided outside the ADA service area to allow eligible riders to travel into the ADA area.	ADA: $2 Beyond ADA: Riders are to call for service and fare information.
Springfield, MA Pioneer Valley Transit Authority	302 Square Miles 551,543 Population	Beyond ADA area: ADA riders can book trips beyond the ADA area.	ADA: $3 to $3.50 Beyond ADA area: $5
San Jose, CA Valley Transportation Authority (VTA)	346 Square Miles 1,938,180 Population	Beyond the ADA area: service available up to one mile outside the ADA service area.	ADA: $4 Premium service/beyond the ADA area: $16
San Bernardino, CA Omnitrans	466 Square Miles 1,487,235 Population	Beyond ADA area: Trips provided outside the required ADA area.	ADA: Depends on zones/distance traveled starting at $3.75 Beyond ADA area: Surcharge over ADA fare of $5.
Boston, MA MBTA	3,244 Square Miles 3,109,308 Population	Beyond ADA area: ADA riders can travel beyond the required area up to area previously served before service area reduced to ADA requirements.	ADA: $3.15 Beyond ADA Area: $5.25

Attachment B: Development of ADA Paratransit Alternatives

Development of the four ADA paratransit alternatives required a range of analyses to estimate numbers of riders, trips by riders, and operational costs for each of the four alternatives and for each year of the time horizon used for the study. This attachment provides more details on the development of these estimates.

Time Period

We have developed estimates of active riders, trips and operational costs for the four alternatives for a five-year time period, with year one of that period 2021. Detailed analyses of Trapeze data from 2018 provided baseline data on number of riders, trips per riders according to whether they lived inside or outside the ADA service area, and productivity. From this baseline year data, we developed projections to 2021. From that year, increases over the next four years used calculated increases in estimated riders and cost per hour. The year 2018 was used as the baseline as it represents an operational year without significant numbers of trips removed through the taxi voucher program for subscription riders.

Growth in Riders

We are using the number of active riders in the baseline year to project growth in ridership. Active riders are defined as those riders who took more than two trips in 2018. The reason this filter is applied is to remove the casual rider who may only have traveled on Open Door for certification purposes.

Growth in the number of active riders over the five-year time period is based on the compounded annual growth rate of the disabled population in Marion County over the period 2012-2017. The growth rate data were obtained from the U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates, Table S1810, which is the most recently available population data on disabled persons.

We note that the number of active riders has been relatively stable for the sampled time period from 2016 through 2019, as documented in the Tasks 2 and 3 Report. However, we cannot assume that this will continue into the future for a number of reasons, including population projections that forecast increasing number of seniors, which is a population cohort with higher rates of disability than younger age cohorts. There are other unknowns and uncertainties that could impact the growth in the number of active riders, as discussed in the body of this report.

Operational Cost

Estimates of operating costs for the four ADA paratransit alternatives are based on data submitted by the current contractor to IndyGo with its Best and Final Offer (BAFO), dated

November 21, 2017. The first year of the five-year estimates for the Open Door alternatives is option year one of the contractor's five-year BAFO costs. From the total cost figures provided in the BAFO, we computed the cost per hour using a total of 198,000 revenue hours, as shown on the cost forms.

The cost data for the first and second year of the five-year estimates for the ADA alternatives use the contractor's BAFO data. For the third, fourth and fifth years of the ADA alternatives, we increased the cost per hour each year by 2%. We note that the average actual annual increase in the cost per hour over the contractor's five years of submitted cost information was 1.7. To be conservative, we rounded this to 2% for this study.

Productivity

Productivity figures were calculated using detailed analyses of Trapeze data, described below. One significant facet of the Trapeze analyses was identifying trips by whether the trip origins and destinations were inside, outside or crossed the ADA service area boundary. These trips were further identified by whether the rider had a home location inside or outside the required ADA service area.

Cost per Trip

Cost per trip is estimated using the operating cost data described above and the productivity factors calculated from Trapeze analyses of the baseline year data.

Trapeze Analyses

The analyses were completed using the Trapeze v12 in use at IndyGo, including the Schedule Administrator module for managing daily schedules, the Batch Scheduling tool which allows for different solutions parameters and violation settings to be applied depending on the specific requirements of the batch, and the geographic analysis module PLAN, which compares addresses' longitude and latitude to determine whether an address is inside or outside defined polygons (in this case, the ADA Service Area polygon).

To determine the productivity factors to use for the four ADA alternatives, we selected a representative high-volume Wednesday in August of the baseline year. It was important to select a day before significant numbers of subscription trips were shifted away from Open Door to taxi options. In Trapeze, trip data from the representative day was copied forward to a date in the future and then all trips were reset to a state that would have existed the night before the service date (for example, all no-shows, missed trips and cancellations were returned to a state that allowed for them to be scheduled). Because of several changes to the composition of the Open Door bus fleet since August 2018, current fleet data were used for the analysis in order to closely mirror existing vehicle capacities, with service hours adjusted to account for the higher trip volumes given the projected increase in number of active riders.

The result was a future date available for review and analysis, with similar operational characteristics to the representative day.

For alternative #1 (Status Quo), trips were scheduled with existing parameters in Trapeze to confirm a reasonable expected on-time performance and achieving trip productivity of 1.6 trips per revenue hour.

For Alternative #2 (Required ADA Service Only), only those trips with an origin and a destination inside the ADA Service area were evaluated for scheduling and available service hours were reduced by 10%. This was done because there would be a reasonable expectation that the amount of service capacity would not be available due to reduced trip volume (in this case, 15%). As expected, scheduled productivity improved but to a level less than anticipated (1.64). This could in part be explained because trips excluded from the analysis are near the border of the service area, and their inclusion may have provided for increased ride-sharing opportunities with a minimal impact on revenue hours (see Exhibit B-1).

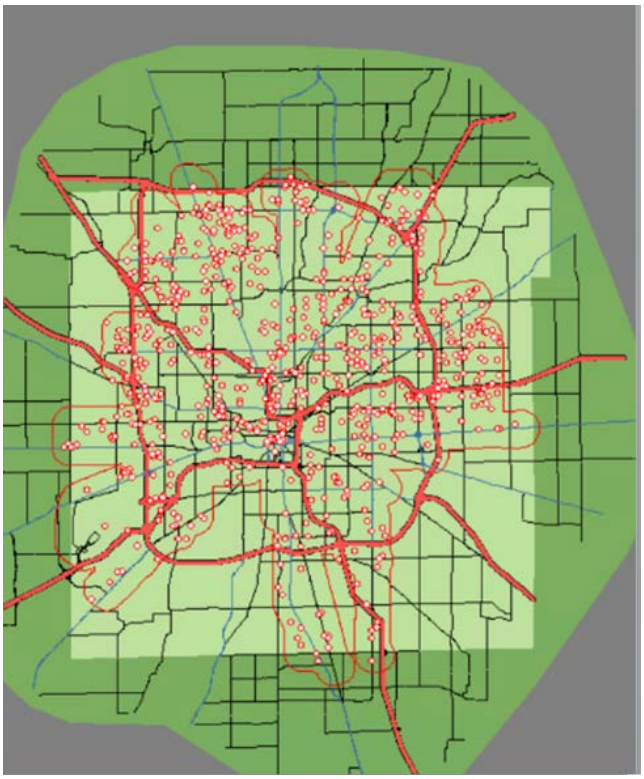


Exhibit B-1

For Alternative #3 (Required ADA Service and Grandfathering), trips inside and outside the ADA service area were assessed separately. Since active riders living inside the ADA area can travel only inside that area, the productivity factor calculated for Alternative #2, ADA Service Only, was assumed. Regarding the grandfathered service, the number of grandfathered riders decreases over time, so that the number of trips with one or both ends outside the ADA area also decreases. With the reduced demand density, a lower productivity factor was used. It is noted that actually providing two "separate" services (ADA only trips and grandfathered trips) is not a realistic operational model when using a single provider, given that the service area for the grandfathered riders completely surrounds the ADA service area.

For Alternative #4 (ADA and Non-ADA Service Areas), the analysis assumes a productivity lower than that used for Alternative #1, considering that the number of trips to and from the Non-ADA Service Area decreases with the higher fare. That reduces the demand density of trips. Unlike Alternative #3, however, the number of active riders living in the non-ADA area increases over time, which impacts the number of trips and resulting cost estimates over time.

Based on the conduct of the analyses, we are adding several observations and comments regarding the service area review and productivity analysis:

- The ADA service area polygon in Trapeze should be updated to reflect current fixed route schedules. The data suggests this may not have been done for several years, and while the overall impact may not have had a material difference for the purposes of developing ADA alternatives for this study, any enforcement of the ADA service boundaries in the future would require attention to the maintenance of this information.

- Because Open Door has a very large subscription trip base (approximately 60%), there are opportunities for improving scheduling efficiency that are not as readily available to transit agencies with a high "casual" trip demand. Trip negotiation and subscription trip "templating" are key factors to improving scheduling efficiency, and while this analysis focused on existing subscription trip information in the system, there are tools available in Trapeze to assist with identifying negotiation opportunities which should be explored further.

- Similarly, the alignment of vehicle hours to trip demand can have a significant impact on operating costs. Identifying when there is slack during the day and then reducing the number of vehicles on the street in those periods translates to fewer revenue hours. If available, a realignment of driver schedules to include split-shifts may be another opportunity

- Providing the contractor with a full Trapeze test environment would allow for various scheduling scenarios to be conducted, with positive results applied to production.

Fare Structure

The five-year estimates for the Open Door alternatives assume that the current fare of $3.50 holds for all the alternatives except for Alternative #4 with two service areas. For that alternative, we assume a higher fare of $7.00 for trips with one or both ends outside the service area, which is double the current fare. Trips outside the ADA service area are not required by the ADA and are considered a premium over the requirements.

Given the higher fare, trip demand will decrease over current use. We have assumed a 40% decrease in trip demand, using data from TCRP Report 95, *Travel Response to Transportation System Changes-Chapter 6 Demand Responsive/ADA*. It is important to note that there is very limited data on the degree to which fare increases impact ridership on demand responsive services and even less on ADA paratransit service. Based on experience, we would expect a decrease in ridership with a doubling of the fare, but the decrease could be more or less than what we have estimated for the study.