



City of Chicago, Business Affairs and Consumer Protection

TAXI FARE RATE STUDY

Final Report

August 2014

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EXECUTIVE SUMMARY

PURPOSE AND METHODS OF THE STUDY

The objectives of the Chicago Taxi Fare Rate Study were:

1. To provide an analysis of current driver incomes that can be used as one factor in considering whether a fare rate adjustment is appropriate.
2. To develop a spreadsheet-based model that can be used to estimate the impact of fare adjustments on driver income as well as the impact of changes in other policies or external conditions.

In response to the first objective, eight months of detailed trip-by-trip data were analyzed to estimate the income that drivers are able to realize at current rates. The analysis uses data from credit card terminals in all taxicabs that record fare and time information for every trip taken on the meter, whether or not a credit card is used. The analysis also took account of driver costs to pay leases, fees, credit card charges, and fuel.

In response to the second objective, a “Taxi Cost and Fare Rate Model” was developed that can be used to test possible fare adjustments and to vary assumptions and input data that affect driver revenue and costs. Adjustable inputs that affect *revenue* include rates of fare, numbers of trips per hour carried by each driver, and average trip length. Adjustable inputs that affect *costs* include lease rates, average hours worked per driver, fuel economy, and fee levels. Using these inputs, the model estimates total revenue, costs, and net income. It does this for different categories of drivers, defined as full-time drivers, drivers working part time, and drivers working extended hours. The model is calibrated so that it produces results consistent with the detailed analysis of recent trip data. The model is documented in more detail in a manual provided separately to the City.

DATA SOURCES

Trip Data from Credit Card Terminals

The principal source of data for this study was eight months of trip-by-trip records for some 10.6 million taxi trips from January 1, 2013 to August 31, 2013, provided by approximately 3,900 taxis in Chicago (about 56% of the total). This data comes from the wireless, in-vehicle credit card processing system that is required in every Chicago taxicab. The system is linked to the meter along with GPS capabilities. With this technology, credit card processing companies collect electronic data that includes pick-up and drop-off times and locations (when and where the meter was turned on and off) for each trip along with fare and mileage information for *each* trip. Note that this information is collected for *all* trips for which the meter was used, and not just those where a credit card was used. The records include tip amounts for most credit card transaction, averaging about 22%, but not for trips paid in cash, for which a 20% average tip was assumed.

While some trips may still go unrecorded (for example, if the meter was not invoked), the extent of data available is incomparably better than driver manifests or surveys that have been used in some past studies.

A smaller sample of records from another 27% of Chicago taxicabs was also examined, and it was found that drivers of these cabs carried similar numbers of trips and earned similar amounts of revenue. If anything, the drivers represented in the data used for the study may have slightly lower revenues than these other drivers. More detail is provided in the full report.

Driver Survey Data

A driver survey was conducted over a span of two months. The survey prompted for detailed responses on every cost that a taxi driver might incur, such as fuel, maintenance, and insurance. The survey was administered via electronic tablets located at the City's BACP office at 2350 W. Ogden Ave., where taxi driver regularly visit. In the end, 414 completed surveys were received.

The survey data was used to support the Taxi Cost and Rate Model, as described in the manual, by identifying both operating patterns in the city and the range of costs experienced by Chicago taxi drivers, especially owner-drivers, with supplemental cost data drawn from peer cities.

City Records

BACP provided lists of medallion holders, including those that are owner-operators, as well the specific vehicles associated with each medallion. In the analysis of trip-by-trip data from the credit card terminals, this data was used to determine: 1) which trips were carried by owner-operators and which by lease drivers, and therefore whether lease rates or ownership costs should be applied; and 2) based on the vehicle associated with each medallion, what fuel usage and cost would be associated with each trip.

FINDINGS—CURRENT DRIVER INCOME

Net Driver Income per Day and per Year

As will be explained, determining the actual hours worked by each driver involves some uncertainty. For this reason, the most definitive analysis is for driver income per day. These results are based on the eight-months of data for 10.6 million taxi trips. The analysis is for drivers who worked at least 20 days in at least one 30-day span during this eight-month period, which includes nearly 75% of the drivers who worked at all. The other drivers—the remaining 25%—apparently gave taxi driving a short trial and determined that it was not what they wanted to do. Due to their short tenure, it would be inappropriate to include the data from those drivers in this analysis, which is focused on regular, continuing drivers.

The drivers have been grouped according to how many hours they work on average:

- “Part-time” drivers (about 20% of drivers) are those who work up to seven hours a day on average.
- “Full-time” drivers (about 41% of drivers) are those who work more than seven but less than 11 hours a day on average.
- “Extended-time” drivers (about 40% of drivers) are those who work 11 or more hours a day on average.

The analysis found that there are two distinct groups of drivers. One group consists of about one-sixth of drivers, who might be termed “struggling drivers” and carry very few trips despite, in many cases, working the equivalent of full time or even more. A second group consists of the other five-sixths of drivers, who might be termed “productive drivers” and are able to carry many more trips on a consistent basis. Figure ES-1 shows this pattern. There is a large group of drivers who carry an average of 5.0 or fewer trips per day (the “struggling drivers”). This group includes many part-time drivers, but also significant numbers of full-time and extended-time drivers. There is a distinct group of drivers who carry many more trips (the “productive drivers”), typically between 11 and 20 per day and even more.

As will be seen, the struggling drivers appear to be achieving extremely low net incomes, and many of them appear to be consistently losing money, once lease and fuel costs are considered. It is somewhat puzzling that drivers continue driving a taxi if they are losing money or making nearly nothing. It is possible that the data do not show all of their activity (for example if some of their trips are done off the meter, or the credit card equipment for unknown reasons simply fails to record some trips). However, it is also possible these drivers are in fact earning extremely little or even losing money, yet keep attempting to make taxi driving work for them.

Figure ES-1 Struggling and Productive Drivers

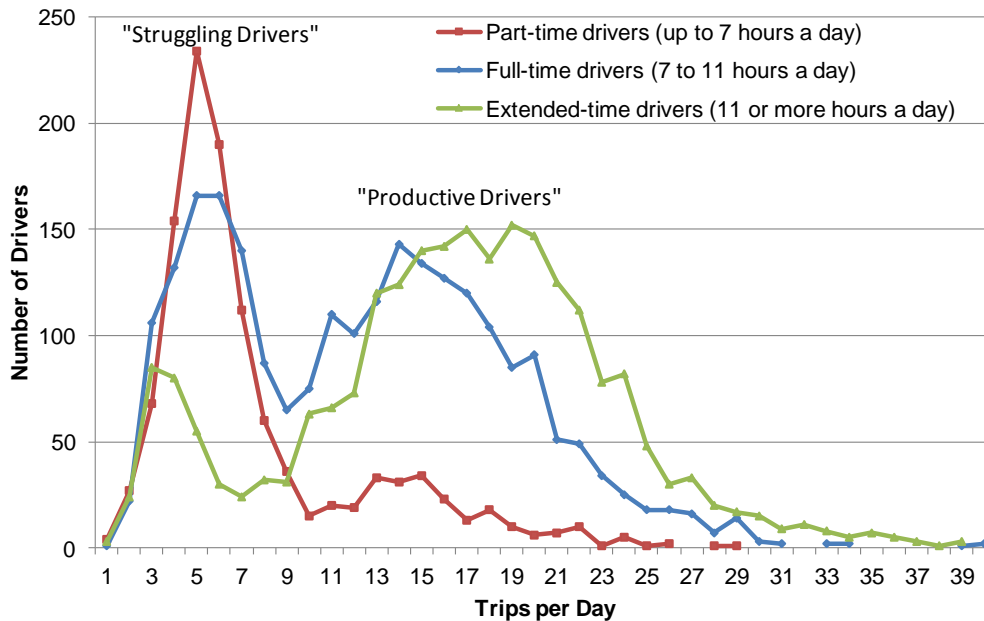
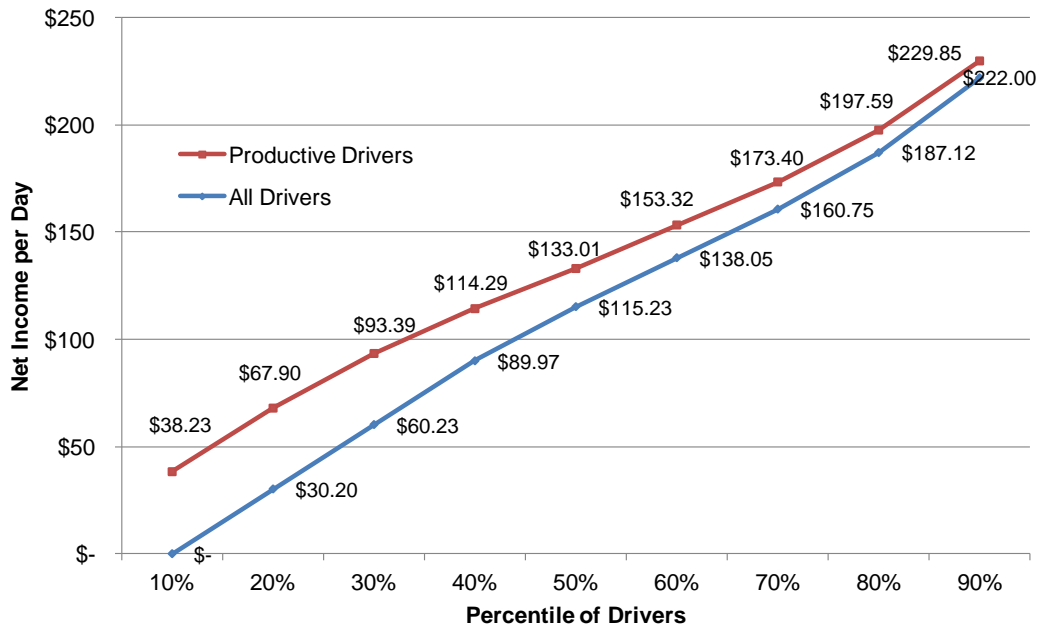


Figure ES-2 shows *net* daily driver income for all drivers and for “productive drivers.” (“Net income” is income after deducting expenses such as lease payments, fuel costs, credit card handling fees, and, in the case of owner-drivers, cost of vehicle ownership and maintenance.) In this case the group of “productive drivers” is defined to exclude only those drivers who carried less than 5.0 trips per day on average. The graph shows percentiles. For example, the income for the 50th percentile is the income for a driver whose income is greater than 50% of drivers and less than the other 50% of drivers. This is also the median driver income, which is \$115 per day for all

drivers and \$133 for the productive drivers, after deducting costs of leasing and operating a cab. The graph also shows, for example:

- 20% of all drivers make a net income of \$30 per day or less, while 20% of productive drivers make \$68 per day or less.
- 20% of all drivers make a net income of \$187 per day or more (the 80th percentile on the graph), while 20% of productive drivers make \$198 per day or more.

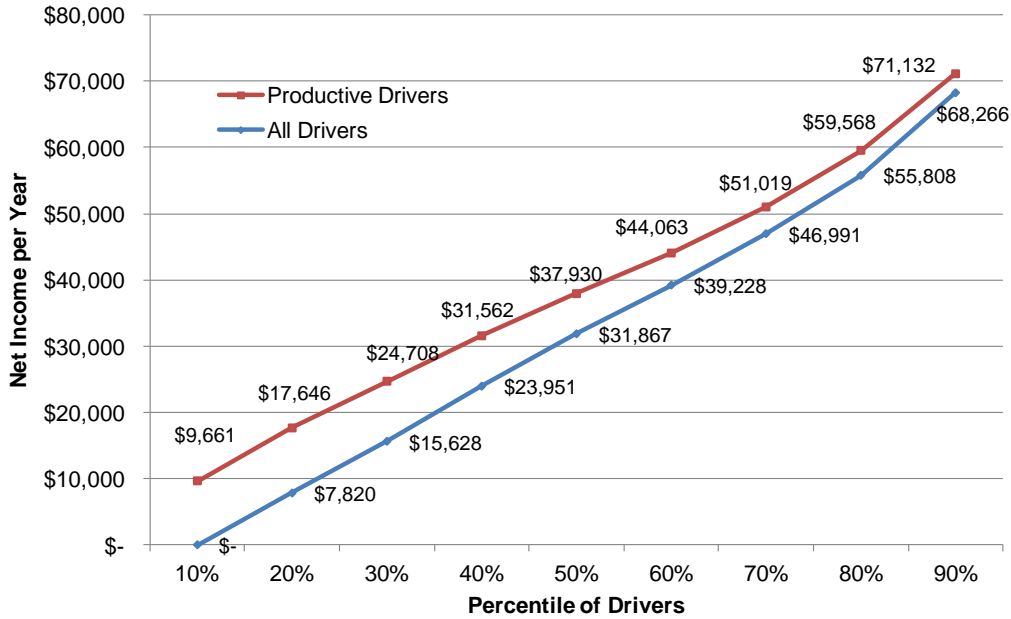
Figure ES-2 Net Driver Income per Day*



*After deducting lease costs and other operating costs.

Income per day is not commonly used to think about what is an adequate income. For this reason, the daily net incomes in Figure ES-2 have been converted to hypothetical annual net incomes, assuming drivers work 50 weeks per year. The result is shown in Figure ES-3, which shows that the median driver, including the “struggling drivers” would make a net income of \$31,867 per year working 50 weeks per year, while the median “productive driver” would make \$37,930.

Figure ES-3 Hypothetical Annual Net Incomes
 (Assuming drivers work 50 weeks per year)



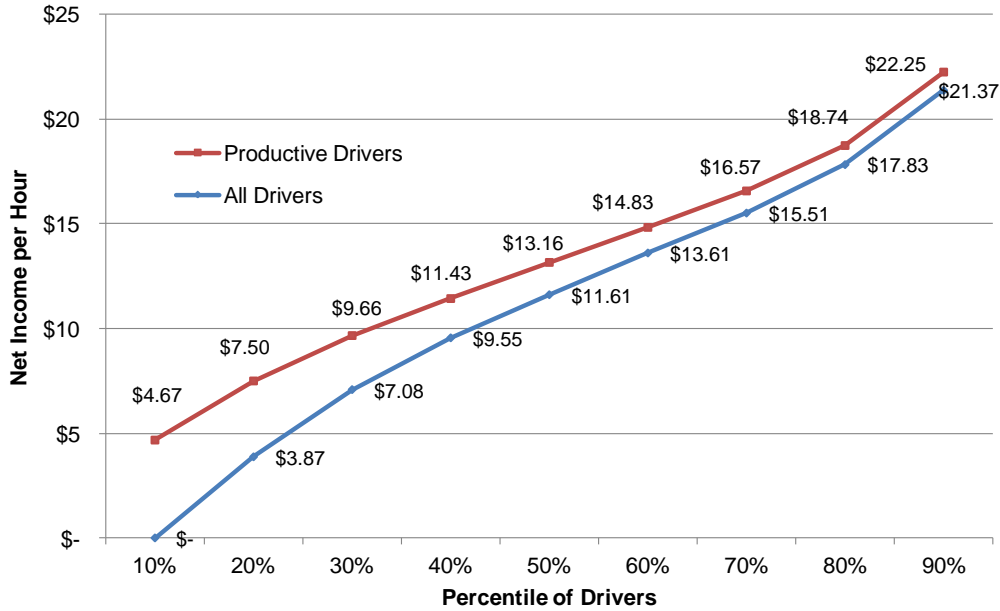
Hourly Driver Income

As noted earlier, there is some uncertainty in calculating the hours worked by each driver from the available data. The trip records show conflicting information about shift times. Long breaks during the day may also be included within apparent shift times. The measure of hours worked used in this study is a compromise between higher and lower estimates that could be made from the available data. Using the lower estimate of hours would result in a much *higher* estimate of hourly earnings. A higher estimate of hours is also possible, which would result in a *lower* estimate of hourly earnings.

Figure ES-4 shows estimated net hourly income for all drivers and for “productive drivers” (excluding the “struggling drivers” who carry less than 5.0 trips per day on average), using a middle, compromise, estimate of hours worked. Among all drivers, the net income for the median (50th percentile) driver is \$11.61 per hour, while among “productive drivers” the median net income is \$13.16. The figure also shows that numerous drivers have incomes far above and far below the median.

Figure ES-4 Net Hourly Income for All Drivers and Productive Drivers

(Using the middle estimate of hours worked.)



Average Revenue and Income

Figure ES-5 shows average revenue and income for drivers depending on whether they work part-time, full-time, or extended-time. These results are for all drivers (including those described as “struggling drivers” before), and use the middle estimate of hours worked. Part-time drivers (see the red line in Figures ES-1 above) have the lowest incomes. This is to be expected partly because many of them carry very few trips (as shown in Figures ES-1), but also because they are assumed to pay for a full 12-hour lease, even though they work less than seven hours per day on average. These drivers have net earnings of approximately \$10.05 per hour, after accounting for leases, fuel, credit card fees, and other costs of operation. Drivers who work full-time or extended-time are doing better, achieving net income of approximately \$12.39 per hour and \$12.50 per hour respectively.

Figure ES-5 Average Driver Revenue and Income

| Work-hours Category | Total Revenue Per Day | Net Income per Day | Hours per Day | Hours per Week | Net Income per Hour | Net Income per Year |
|----------------------------------|-----------------------|--------------------|---------------|----------------|---------------------|---------------------|
| Part-time (up to 7 hours) | \$141 | \$57 | 5.7 | 31 | \$10.05 | \$15,374 |
| Full-time (7 to 11 hours) | \$205 | \$111 | 9.0 | 51 | \$12.39 | \$31,397 |
| Extended-time (11 or more hours) | \$264 | \$160 | 12.8 | 75 | \$12.50 | \$46,614 |
| All drivers | \$215 | \$120 | 9.9 | 56 | \$12.14 | \$33,857 |

Among all drivers, as shown in Figure ES-5, total revenue averages \$215 per day, which is equivalent to \$60,767 per year if drivers work all year, and equivalent to \$21.79 per hour given the middle estimate of hours worked. (The drivers work an average of 5.65 days a week and 56 hours per week.) After deducting expenses, drivers average \$120 net income per day, which is equivalent to \$33,857 per year if drivers work all year, and equivalent to \$12.14 per hour given the middle estimate of hours worked.

Using the same assumptions about hours worked, total expenses average \$26,910 per year. By far the largest component of cost is leases, averaging about \$23,841 per year for those drivers who lease.

Comparison to Other Estimates

Public discussion of taxi drivers often cites extremely low hourly rates of income, far below the levels found in this analysis.

One commonly cited study of Chicago taxi driver incomes estimated driver revenue from a survey of taxi drivers at O'Hare Airport. It is our experience that drivers participating in surveys tend to underestimate revenue. We have also observed that drivers who concentrate on serving the airport often have lower revenues than other drivers who have learned how to maximize their income by serving a variety of areas, often developing a personal base of clients. Compared to a survey of airport drivers, the estimates in this study are based on eight months of real data coming directly from the in-vehicle equipment of more than half the taxi drivers in Chicago. This data is far more representative and statistically accurate than a small survey of drivers serving one specialized submarket of Chicago.

THE TAXI COST AND FARE RATE MODEL

While analysis of data from credit card terminals allows a good estimate of current driver income, the Taxi Cost and Fare Rate Model allows the City to test a variety of changes to fare rates and other factors to determine their impact on driver incomes. It will also allow the City to estimate driver incomes in the future without needing to analyze data from credit card terminals. The model and a user manual for it have been provided to the City.

Model Input and Assumptions

The model has a set of inputs that collectively describe: how drivers work (hours and days driven); the number and length of trips they are able to serve; typical amounts of waiting time that is accrued on the meter; and factors that determine operating costs, including whether drivers lease or own, whether lease drivers lease daily or weekly and for 12 or 24 hours, the percentage of airport trips served, the percentage of credit card trips, vehicle ownership costs and fuel economy, fuel prices, insurance costs, and so forth. As delivered to the City, the model has current values as inputs for all of these factors, but they can all be adjusted to represent future conditions or future policy changes, such as changes to authorized meter rates or lease rates that might be under consideration at some time. The model allows for drivers to be grouped into categories based on number of hours typically worked (part-time, full-time, and extended-time).

For purposes of estimating annual income, the model assumes 50 weeks worked per year, typical driver working hours, and typical costs. Drivers working greater numbers of hours are able to

spread fixed costs over greater numbers of miles and make progressively more per driven mile. Drivers working fewer hours make proportionately less per driven mile for the same reason.

Model Outputs

The output of the model includes:

- Average **annual revenue** for each driver group and for the entire set of drivers
- Average of **annual costs** incurred by each driver group and for the entire set of drivers
- Average of annual **net income** for each driver group and the entire set of drivers

Separate estimates are provided for part-time, full-time, and extended-time drivers, for drivers with various lease types, and for owner-drivers.

Possible Next Steps

The price elasticity of demand may also be used to identify impacts of changes to taxi rates, but was not in the scope of this study. The City may wish to consider a “model augmentation” that would consider public responses to changes in fares.

1 INTRODUCTION

BACKGROUND

The Public Vehicle Operations Division of City of Chicago's Department of Business Affairs and Consumer Protection (BACP) oversees the taxi industry for the City. Included in the taxi regulations are provisions that control:

- The number of taxi medallions that are issued, which in effect controls the number of taxis in service. The number of taxis is capped at 6,999 of which 6,899 are currently issued.
- The maximum lease rates paid by a driver to a taxi medallion owner. Taxi drivers can be categorized into groups, including:
 - Owner operators—who have purchased medallions and drive their own cab
 - Lease drivers—who will pay medallion owners a 12-hour or 24-hour lease payment for the use of their taxicab. Some of these arrangements are daily, and some are weekly. Subleasing is not allowed.
- The taxi fare meter rate, which affects both the public welfare (customers being able to afford taxis for their mobility needs) and the taxi medallion owners' and lease drivers' livelihoods.

The purpose of setting a maximum lease amount is to protect lease drivers. Drivers' income consists of fare revenues less costs of operation, of which lease payments are the largest component, and one that is fixed regardless of miles driven or fares collected. If the City were to adjust taxi fares, the City's cap on lease rates would protect lease drivers from the possibility of medallion owners increasing lease rates to capture most or all of the additional revenue.

In July 2012 the City repealed and replaced all rules and regulations governing taxis, as they were found to be difficult to understand and to enforce; amendments were found to be inconsistent; and incentives ineffective. As part of this overhaul of taxi regulations, new measures were introduced to incentivize taxi medallion owners to modernize the fleet of taxi cabs with newer, fuel-efficient and wheelchair-accessible taxis. Also, new maximum lease rates were put into effect. Formerly there was only one maximum lease rate that hadn't been adjusted in 17 years. Under the new regulations, three tiered lease caps tied to the fuel efficiencies of the taxicab vehicles were introduced.

PURPOSE AND METHODS OF THE STUDY

The objectives of the Chicago Taxi Fare Rate Study were:

1. To provide an analysis of current driver incomes that can be used as one factor in considering whether a fare rate adjustment is appropriate.
2. To develop a spreadsheet-based model that can be used to estimate the impact of fare adjustments on driver income as well as the impact of changes in other policies or external conditions.

In response to the first objective, eight months of detailed trip-by-trip data were analyzed to estimate the income that drivers are able to realize at current rates. The analysis uses data from credit card terminals present in all taxicabs that record fare and time information for every trip taken on the meter, whether or not a credit card is used. The analysis also took account of driver costs to pay leases, fees, credit card charges, and fuel.

In response to the second objective, a “Taxi Cost and Fare Rate Model” was developed that can be used to test possible fare adjustments and to vary assumptions and input data that affect driver revenue and costs. Adjustable inputs that affect *revenue* include rates of fare, numbers of trips per hour carried by each driver, and average trip length. Adjustable inputs that affect *costs* include lease rates, average hours worked per driver, fuel economy, and fee levels. Using these inputs, the model estimates total revenue, costs, and net income. It does this for different categories of drivers, defined as full-time drivers, drivers working part time, and drivers working extended hours. The model is calibrated so that it produces results consistent with the detailed analysis of recent trip data. The model is documented in more detail in a manual provided separately to the City.

These methods were chosen by mutual agreement between the City and the consulting team. They give the City the most relevant information for its decision making process by focusing on conditions that are specific to Chicago. Alternative methods, such as comparisons to other cities, were judged as less useful since they do not account for the numerous differences among cities in economic conditions, geography, regulatory methods, and the organization of the taxi industry.

REPORT ORGANIZATION

The report includes sections dedicated to data collection and methodology, the analysis of current driver income, and a description of the spreadsheet model. A user manual for the spreadsheet model is being provided to the City as a stand-alone document.

2 DATA COLLECTION METHODOLOGY

To fulfill the study objectives, the Nelson\Nygaard Consulting Team (the Consulting Team) collected the following data:

Figure 2-1 Sources of Data

| Financial Element | Source of Data |
|-------------------|---|
| A. Revenue | Electronic trip data from credit card processing vendors |
| B. Costs | Chicago taxi regulations; City records of medallion ownership and vehicles; driver survey; electronic trip data from credit card processing vendors |
| C. Net Income | A minus B |

In order to derive net income for drivers, accurate information was needed on driver revenue and costs. In the contemporary taxi industry, net income for taxi drivers is simply the difference between the revenue, in the form of fares and tips, collected by a driver over some period of time—ranging from a single shift to months or even a year—and the costs of operating a taxi vehicle for this same period of time.

For drivers who lease their taxis, which is a large majority of the taxi drivers in Chicago, the largest operating cost is the daily or weekly lease fee for the right to use the taxicab and its medallion. The other major cost incurred by lease drivers is fuel for the vehicle for the period of time they drive it. Other costs include, license fees, airport fees, credit card processing charges, and, for some drivers, fees to smart phone dispatch app providers for drivers that partner with such companies.

For those drivers who own their own taxi and medallion (“owner-drivers”), there are no lease fees, but there are other major costs including the medallion finance cost, vehicle depreciation, maintenance, inspection fees, insurance, and the annual medallion fee.

Historically, cost and revenue data for taxi operations needed to be collected via surveys of drivers and/or an analysis of hardcopy driver manifests. Such efforts proved to be expensive and time-consuming and were fraught with imprecision. It is very difficult to convince large numbers of drivers to complete a survey that requests what many would consider confidential information. It is time-consuming and expensive to conduct such a survey. It is also extremely difficult to obtain a representative sample of drivers, one that includes busy, high-earning drivers as well as those with less business, drivers who serve the airport, drivers who serve downtown, drivers who serve mainly dispatch trips, and drivers who have large numbers of regular repeat clients.

However, the recent introduction of on-board electronic technology in the taxi industry has completely changed this situation. With the advent of electronic data reporting, more trip data

and more accurate trip data has become available. Under Chicago’s taxi regulations, 100% electronic data capturing is required, and upon demand, must be provided to the City. Thus, for this study, the consulting team was able to obtain high quality data at very low cost, as explained below.

TRIP DATA FROM CREDIT CARD PROCESSING VENDORS

Chicago taxi regulations require that all taxicabs be equipped with a wireless credit card processing system (mounted in the passenger compartment) that is linked to the taximeter, which in turn is linked to a GPS system in the cab. The owner of the taxicab—or the association to which the owner belongs—selects a credit card processing vendor that provides this in-vehicle technology. There are two credit card processing companies, Creative Mobile Technologies (CMT) and Verifone, which serve virtually all of the taxis in Chicago.

This in-vehicle technology collects electronic data for *all trips for which the meter is turned on* and not just trips paid for with credit cards. Thus, by using the data captured by the CMT and Verifone technology, it is possible to create a record of the activity of every licensed taxi in Chicago over a long period of time. The GPS readings make it possible to determine the location of trip origins and destinations and to estimate the length of each trip. In addition, it is possible to determine the approximate length of driver shifts. It is important again to emphasize that this information is collected for all trips for which the meter was used, and not just those where a credit card was used.

There are two areas of uncertainty in the data. First, the technology may not record all trips, especially those where the driver does not turn on the meter. An example of such a trip might be one requested and paid for through a taxi app (even if regulations require the meter to be running). The absence of data for some trips can only lead to an under-estimate of fare revenues for drivers and accordingly renders the analysis conservative, that is, more likely to underestimate income than overestimate it. The second source of uncertainty is in precisely counting hours worked. This imprecision does not affect the estimate of total daily income, but it does create some uncertainty in converting daily income to hourly income.

For this study, BACP staff was initially able to acquire eight months of trip data from CMT only, representing trips from January 1, 2013 to August 31, 2013. Approximately 3,900 taxis in Chicago (about 56% of the total) use CMT as their credit handling technology provider. This data, consisting of records for some 10.6 million trips, was loaded into an Oracle database for analysis.

Each CMT data record contained the following fields:

- Vehicle number (same as medallion number)
- Medallion number
- Driver name (optional)
- Hack number (driver permit number)
- Shift start date
- Shift start time
- Shift end date
- Shift end time
- Trip pickup date and time
- Trip dropoff date and time

- Trip pickup location (if geo-coding was successful)
- Trip dropoff location (if geo-coding was successful)
- Passenger count (rarely populated)
- Payment type
- Fare amount
- Tolls
- Tip
- Extras
- Tax
- Total fare
- Trip time
- Trip distance (often missing)
- Taxi operator company name
- Pickup latitude (GPS reading)
- Pickup longitude (GPS reading)
- Dropoff latitude (GPS reading)
- Dropoff longitude (GPS reading)

The records include tip amounts for most credit card transaction, averaging about 22%, but not for trips paid in cash, for which a 20% average tip was assumed.

Towards the end of the project, and after the analysis of the CMT data had been completed, BACP was able to obtain access to Verifone data representing another 27% of the taxis. The data fields for the Verifone data set are essentially the same as the CMT data set.

Because of the length of time it would require to conduct a parallel analysis of the Verifone data, and the likelihood that the results of this analysis would be very similar to that of the CMT data, it was decided to test whether a sample of the Verifone data had similar characteristics to the CMT data before doing a parallel, detailed analysis of the Verifone data. A sample consisting of two weeks of Verifone data, representing 370,000 trips carried by 1,890 drivers in May and June 2013 was analyzed to determine whether the characteristics and driver compensation for these trips was materially different from the trips recorded by the CMT technology. Of particular focus was the driver compensation, as that is fundamental to the issue of the adequacy of the current taxi fare rates.

Figure 2-2 through Figure 2-4 summarizes the results of the comparison of the CMT data set and the sample data from the Verifone devices. Figure 2-2 provides information on the two data sets. To compare the Verifone sample to the much larger CMT data set, two key measures were used: number of trips per day and gross driver revenue per day. Multiple comparisons were made between the two data sets: one set of comparisons restricted to the same days in May 2013 and June 2013 and the other set of comparisons between the two weeks of data from the Verifone May-June data set and the eight-month CMT data set. Summaries of these comparisons are shown in Figure 2-3, and Figure 2-4.

Figure 2-2 The CMT and Verifone Data Sets

| | CMT Sample | Verifone Sample |
|----------------------------|---------------------|---------------------------|
| Time Period of Data Sample | 8 months (35 weeks) | 2 separate 1-week periods |
| Number of Taxi Trips | 10.64 million | 370,000 |
| Number of Taxis | 3,883 | 1,248 |
| Number of Drivers | 8,067 | 1,890 |

Figure 2-3 Comparison of May–June Sample Data (2 weeks total, 1 week in each month)

| | CMT | Verifone |
|-----------------------------------|----------|----------|
| Avg. Trips per Driver per Day | 14.6 | 16.9 |
| Avg. Gross Driver Revenue per Day | \$209.68 | \$225.74 |

Figure 2-4 Comparison of CMT 8-Month Data Sample and Verifone 2-Week Data Sample

| | CMT | Verifone |
|-----------------------------------|----------|----------|
| Avg. Trips per Driver per Day | 16.6 | 16.9 |
| Avg. Gross Driver Revenue per Day | \$222.20 | \$225.74 |

Standard deviations for these average values and standard errors were also computed and found to be similar for the two data samples. In every case, the Verifone drivers were determined to be slightly more productive and profitable than the CMT drivers. The concern that the CMT drivers might be generating more trips and receiving more gross compensation than other drivers—hence any possibility of an unjustified conclusion that no fare increase was needed based on the CMT data—was not supported by this data comparison. If anything, the Verifone data sample indicates that relying on the comprehensive CMT data set—with its slightly lower driver productivity and income—will produce conservative conclusions. It is therefore appropriate, at least for this study, to generalize about driver productivity, gross and net income, and other measures of driver activity and profitability based on the results of the eight-month CMT data sample.

DRIVER COST DATA

For drivers who lease their taxis, which are the large majority of drivers in the Chicago taxi industry, the two largest sources of operating costs are lease payments and fuel costs. Both of these were estimated using a combination of the CMT data and records provided by BACP.

The lease fee is paid daily or weekly to the owner of the taxi and/or the taxi medallion. That lease fee is determined by a fee schedule established by the City, presented in Figure 2-5, which sets different fee levels for taxi vehicles based on fuel economy. Each vehicle model which is approved for taxi use is classified into one of the three tiers. Tier 1 consists of hybrid, electric, or CNG-fueled vehicles. Tier 2 includes conventionally fueled vehicles achieving at least 25 MPG and a small number of CNG-fueled vehicles. Tier 3 vehicles are relatively fuel-inefficient vehicles such as the Ford Crown Victoria, the traditional workhorse of the Chicago taxi fleet.

Figure 2-5 Taxi Lease Rates by Vehicle Fuel Economy Tier

| Tier No. | 12-Hour Daily Max Lease Rate | 12-Hour Weekly Max Lease Rate | 24-Hour Daily Max Lease Rate | 24-Hour Weekly Max Lease Rate |
|----------|------------------------------|--|------------------------------|--|
| 1 | \$74 per 12 hour shift | \$518 total for seven consecutive 12 hour shifts | \$101 per 24 hour shift | \$707 total for seven consecutive 24-hour shifts |
| 2 | \$69 per 12 hour shift | \$483 total for seven consecutive 12 hour shifts | \$93 per 24 hour shift | \$651 total for seven consecutive 24-hour shifts |
| 3 | \$59 per 12 hour shift | \$413 total for seven consecutive 12 hour shifts | \$85 per 24 hour shift | \$595 total for seven consecutive 24-hour shifts |

As can be seen in Figure 2-5, drivers who lease more fuel efficient vehicles pay higher lease fees, but this is offset by the lower fuel costs. For example, a taxi driver who leases a Crown Victoria (EPA fuel economy rating of 19 MPG) for a 12-hour daily shift and drives 125 miles per day would pay a lease fee of \$59 and approximately \$26 for fuel—for a total daily outlay of \$85. If that same driver leased a Toyota Camry hybrid (EPA rating of 41 MPG) for \$74 per day, they would pay only approximately \$12 for fuel for 125 miles, yielding a total daily outlay of \$86, or approximately the same as with the Crown Victoria.

BACP provided a master list of the vehicles associated with each medallion number. The CMT data set provided the Vehicle/Medallion number of the taxi used by each driver each day. A lookup table in the database was used to connect each trip to the vehicle model, its lease fee, and its estimated fuel economy. Knowing the fuel economy, and how many miles the vehicle was driven for the day—which could be estimated from the data set, as explained below—and the approximate cost of gasoline per gallon (from published sources, for the Chicago region), each driver’s expenses for their shift could be calculated.

In order to estimate a driver’s daily fuel costs, it was necessary to know approximately how many miles were driven each day. The CMT data set contained GPS-based location information for each trip’s pickup and dropoff points, expressed as latitude and longitude. With this data it is possible to precisely calculate the straight line distance of each trip. A street circuitry factor of approximately 1.25 (appropriate for U.S. cities) was then used to estimate the actual on-street travel distance of the trip. With these data, a good estimate could be made of so-called “paid miles”, that is, miles driven with a fare-paying customer in the taxi.

However, paid miles represent only a portion of all miles driven by a taxi, so it was necessary to estimate total miles driven, including when there is no passenger in the vehicle. Using the CMT data set, it was possible to compute the distance from the completion of one fare-paying trip to the beginning of the next fare-paying trip (including the adjustment for street circuitry). This was done for each set of consecutive trips. This yielded an estimated ratio of 0.67 paid miles per total miles driven. This is unrealistically high, considering a taxi industry rule of thumb of 0.50 paid miles per total miles driven. Using this high estimate would underestimate total miles driven, and therefore underestimate fuel costs, and overestimate net driver income. To avoid underestimating fuel costs, total miles were calculated assuming a ratio of 0.58 paid miles per total miles driven, mid-way between the taxi industry rule of thumb and the value estimated from the data.

Drivers' fuel costs are calculated as total miles driven, divided by the fuel economy of the taxi vehicle, multiplied by the cost per gallon of fuel. To estimate the cost of fuel, information on average costs of regular, unleaded gasoline for the Chicago region for 2013 were used. For the period under consideration, namely January 1, 2013 thru August 31, 2013, retail gasoline prices in Chicago varied from a low of \$3.31 per gallon (during the first week of January) to a high of \$4.36 per gallon (during the second week of June). The average price during this period was \$3.90 per gallon, and it was this value that was used to calculate driver fuel costs. (At the time in question, about 5% of the taxi fleet consisted of CNG fueled vehicles. The cost of a gallon-equivalent of CNG is about two-thirds the cost of a gallon of gasoline. By using gasoline prices for all vehicles, the analysis could be overestimating fuel cost by about 1.6%).

One final adjustment was needed to accurately estimate driver compensation. A significant portion of taxi fares in Chicago are paid via credit cards; the CMT data indicated that about 47% of total fare revenue was paid via credit cards. Drivers are typically charged a 5% fee by taxi company owners for a credit card transaction. Therefore, each driver's net compensation was reduced by 5% of the total amount of fares they collected from credit card transactions. The CMT data always indicated whether a trip was a credit card trip or a cash trip, so this adjustment was easily made.

DRIVER SURVEY DATA

While the data from the credit card processing vendors yielded excellent information on driver revenue, a separate effort was required to identify costs incurred by taxi medallion owner/operators.

This was accomplished via a driver survey that was conducted over a span of two months. The survey instrument itself (Appendix A) was developed in cooperation with BACP staff. The survey prompted for detailed responses on every cost that a taxi driver might incur, such as fuel, maintenance, and insurance. The survey also asked questions related to service patterns and revenue that were helpful in terms of driver groupings and revenue estimates, respectively.

The survey was administered via three electronic tablets that were placed at the BACP office at 2350 W. Ogden Ave., where taxi drivers regularly visit. As drivers waited to renew their license, pay fines, etc. they were encouraged to complete the survey. In addition, the survey was publicized in the Chicago-based *Taxi Times*. In the end, 414 completed surveys were received.

3 ANALYSIS OF CURRENT DRIVER INCOME

NET DRIVER INCOME PER DAY AND PER YEAR

As will be explained, determining the actual hours worked by each driver involves some uncertainty. For this reason, the most definitive analysis is for driver income per day. These results are based on the eight-month CMT data set of 10.6 million taxi trips. The analysis is for drivers who worked at least 20 days in at least one 30-day span during this eight-month period, which includes nearly 75% of the drivers who worked at all. The other drivers—the remaining 25%—apparently gave taxi driving a short trial and determined that it was not what they wanted to do. Due to their short tenure, it would be inappropriate to include the data from those drivers in this analysis, which is focused on regular, continuing drivers.

The drivers have been grouped according to how many hours they work on average:

- “Part-time” drivers (about 20% of drivers) are those who work up to seven hours a day on average.
- “Full-time” drivers (about 41% of drivers) are those who work more than seven but less than 11 hours a day on average.
- “Extended-time” drivers (about 40% of drivers) are those who work 11 or more hours a day on average.

The analysis found that there are two distinct groups of drivers. One group consists of about one-sixths of drivers, who might be termed “struggling drivers” and carry very few trips despite, in many cases, working the equivalent of full time or even more. A second group consists the other five-sixths of drivers, who might be termed “productive drivers” and are able to carry many more trips on a consistent basis. Figure 3-1 shows this pattern. There is a large group of drivers who carry an average of 5.0 or fewer trips per day (the “struggling drivers”). This group includes many part-time drivers, but also significant numbers of full-time and extended-time drivers. There is a distinct group of drivers who carry many more trips (the “productive drivers”), typically between 11 and 20 per day and even more.

As will be seen, the struggling drivers appear to be achieving extremely low net incomes, and many of them appear to be consistently losing money, once lease and fuel costs are considered. It is somewhat puzzling that drivers continue driving a taxi if they are losing money or making nearly nothing. It is possible that the data do not show all of their activity (for example if some of their trips are done off the meter, or the credit card equipment for unknown reasons simply fails to record some trips). However, it is also possible these drivers are in fact earning extremely little or even losing money, yet keep attempting to make taxi driving work for them.

Figure 3-1 Struggling and Productive Drivers

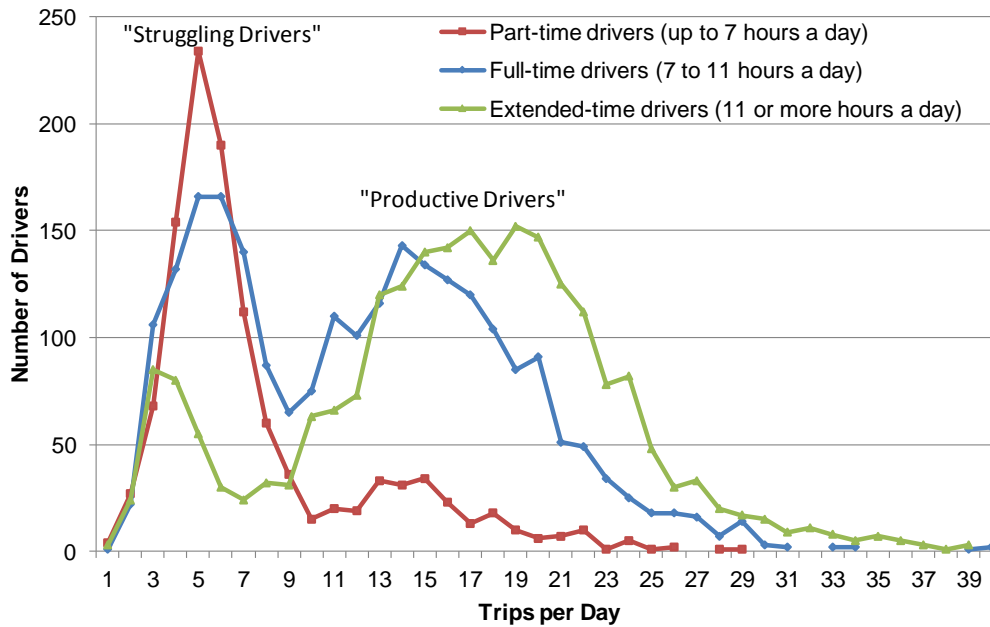
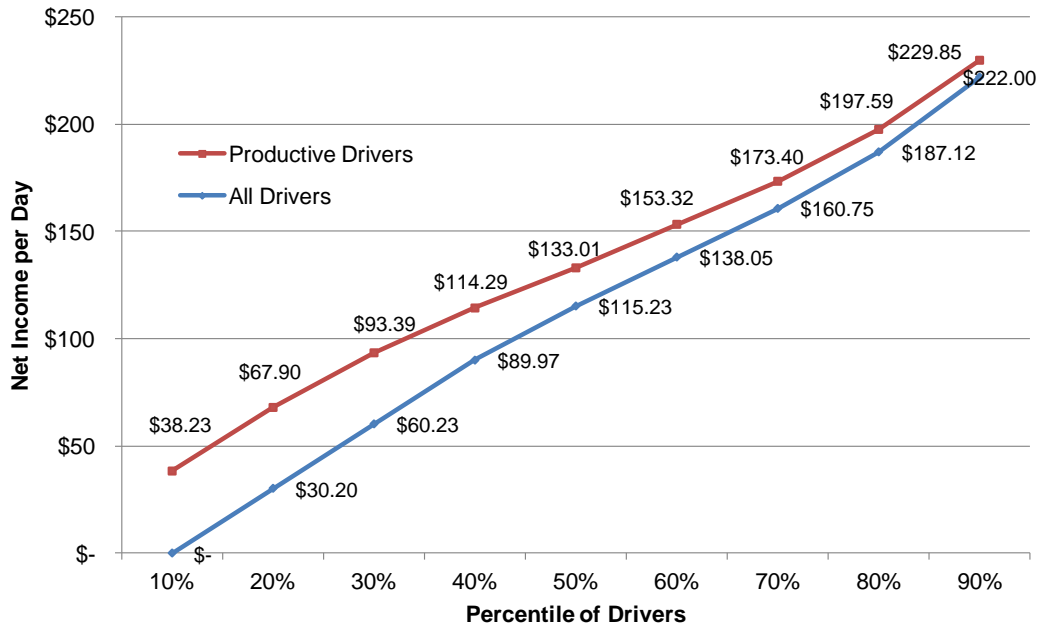


Figure 3-2 shows net daily driver income for all drivers and for “productive drivers.” In this case the group of “productive drivers” is defined to exclude only those drivers who carried less than 5.0 trips per day on average. The graph shows percentiles. For example, the income for the 50th percentile is the income for a driver whose income is greater than 50% of drivers and less than the other 50% of drivers. This is also the median driver income, which is \$115 per day for all drivers and \$133 for the productive drivers, after deducting costs of leasing and operating a cab. The graph also shows, for example:

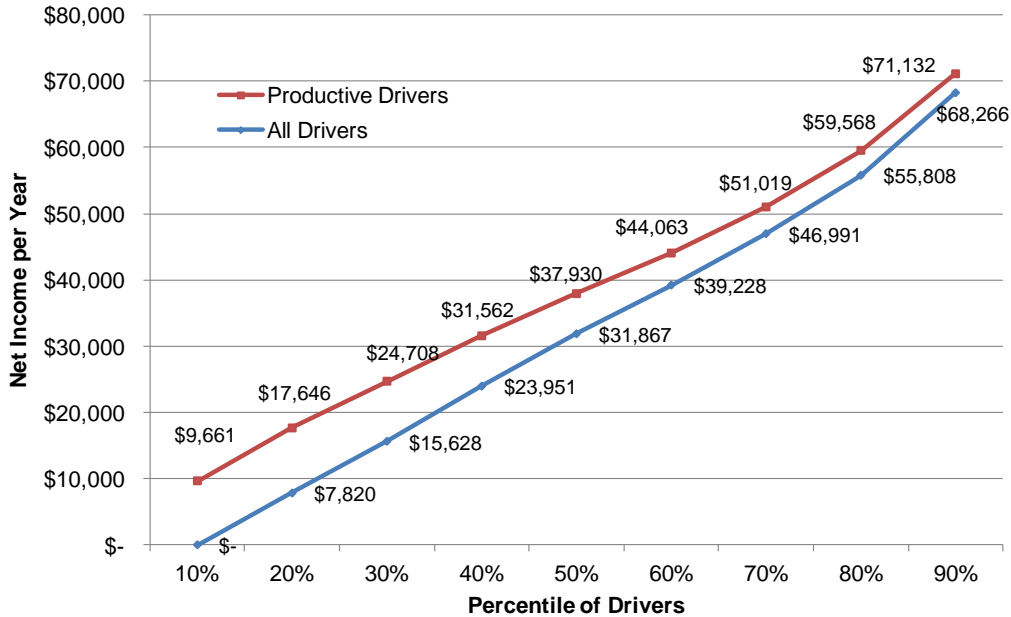
- 20% of all drivers make a net income of \$30 per day or less, while 20% of productive drivers make \$68 per day or less.
- 20% of all drivers make a net income of \$187 per day or more (the 80th percentile on the graph), while 20% of productive drivers make \$198 per day or more.

Figure 3-2 Net Driver Income per Day



Income per day is not commonly used to think about what is an adequate income. For this reason, the daily net incomes in Figure 3-2 have been converted to hypothetical annual net incomes, assuming drivers work 50 weeks per year. The result is shown in Figure 3-3, which shows that the median driver, including the “struggling drivers” would make a net income of \$31,867 per year working 50 weeks per year, while the median “productive driver” would make \$37,930.

Figure 3-3 Hypothetical Annual Net Incomes
 (Assuming drivers work 50 weeks per year)



HOURLY DRIVER INCOME

As noted earlier, there is some uncertainty in calculating the hours worked by drivers from the available data. The CMT data show shift start times and shift end times for each trip record, but these sometimes vary for a single driver on a single day. Some appear to be erroneous. The exact definition of “shift start time” and “shift end time” in this data is unknown. Another issue that, in many cases, it is likely that a driver took one or more breaks during the day, but this is not evident from the data. If a driver leases a cab for multiple days and takes it home, “shift time” could also include some time that could properly be considered commute time. It is also possible to look at actual trips carried and see the span of time from the first pickup of the day to the last dropoff. However, this runs the risk of missing time spent actively searching for work before the first trip or after the last trip. This method too can miss breaks taken during the day. Various combinations of these methods are also possible.

Figure 3-4 shows driver net income per hour using three different estimates of hours worked. The middle estimate of hours worked is based on shift times as recorded in the CMT data. The high estimate of hours uses the shift start times but also takes account of the fact that the data sometimes show a dropoff after the time shown as the end of the shift. The low estimate of hours is based on pickup and dropoff times, with an adjustment for long breaks (six or more hours) during a day. Depending on the estimate of hours worked, the estimated 50th percentile of hourly income (the median) ranges from a low of \$10.44 per hour to a high of \$13.73 per hour. These results are for all drivers.

Figure 3-5 shows estimated net hourly income for all drivers and for “productive drivers” (excluding the “struggling drivers” who carry less than 5.0 trips per day on average), using a middle, compromise, estimate of hours worked. Among all drivers, the net income for the median

(50th percentile) driver is \$11.61 per hour, while among “productive drivers” the median net income is \$13.16. The figure also shows that numerous drivers have incomes far above and far below the median.

Figure 3-4 Multiple Estimates of Income per Hour for All Drivers

(Using three methods of estimating hours worked.)

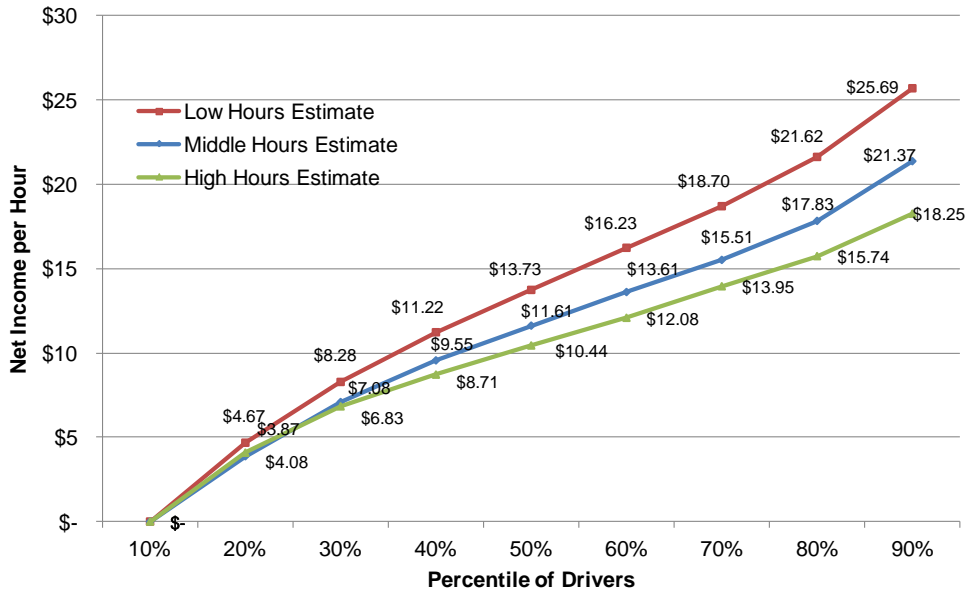
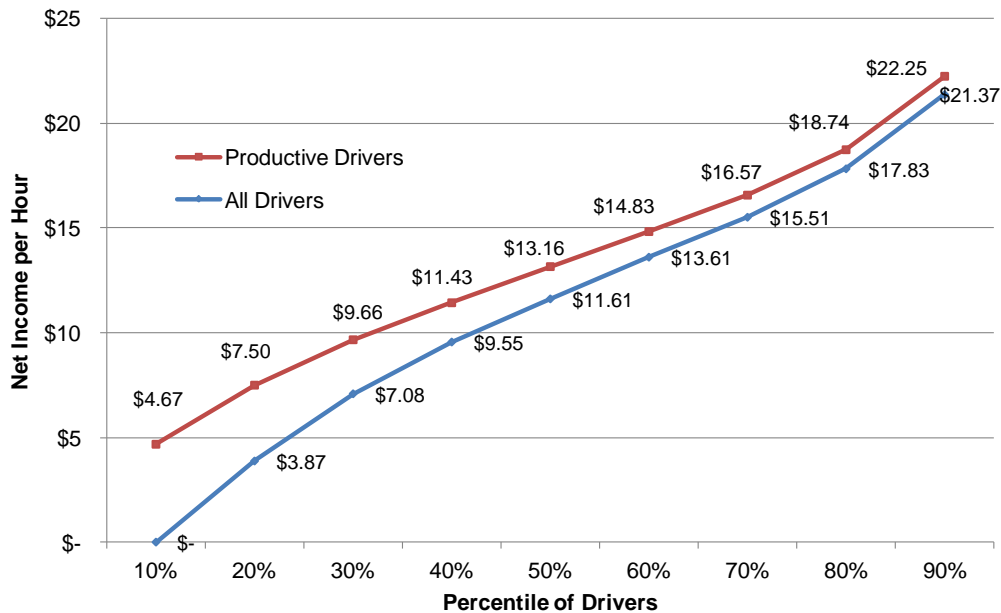


Figure 3-5 Hourly Income for All Drivers and Productive Drivers

(Using the middle estimate of hours worked.)



AVERAGE REVENUE AND INCOME

Figure 3-6 shows average revenue and income for drivers depending on whether they work part-time, full-time, or extended-time. These results are for all drivers (including those described as “struggling drivers” before), and use the middle estimate of hours worked. Part-time drivers (see the red line in Figure 3-1 above) have the lowest incomes. This is to be expected partly because many of them carry very few trips (as shown in Figure 3-1), but also because they are assumed to pay for a full 12-hour lease, even though they work less than seven hours per day on average. These drivers have average net earnings of approximately \$10.05 per hour. Drivers who work full-time or extended-time are doing much better, achieving average net income of approximately \$12.39 per hour and \$12.50 per hour respectively. Among all drivers, earnings average \$120 per day, which is equivalent to \$33,857 dollars if drivers work all year, and equivalent to \$12.14 per hour given the middle estimate of hours worked. (The drivers work an average of 5.65 days a week.)

Figure 3-6 Average Driver Revenue and Income

| Work-hours Category | Total Revenue Per Day | Net Income per Day | Hours per Day | Hours per Week | Net Income per Hour | Net Income per Year |
|----------------------------------|-----------------------|--------------------|---------------|----------------|---------------------|---------------------|
| Part-time (up to 7 hours) | \$141 | \$57 | 5.7 | 31 | \$10.05 | \$15,374 |
| Full-time (7 to 11 hours) | \$205 | \$111 | 9.0 | 51 | \$12.39 | \$31,397 |
| Extended-time (11 or more hours) | \$264 | \$160 | 12.8 | 75 | \$12.50 | \$46,614 |
| All drivers | \$215 | \$120 | 9.9 | 56 | \$12.14 | \$33,857 |

COMPARISON TO OTHER ESTIMATES

Public discussion of taxi drivers often cites extremely low hourly rates of income, far below the levels found in this analysis.

One commonly cited study of Chicago taxi driver incomes estimated driver revenue from a survey of taxi drivers at O’Hare Airport. It is our experience that drivers participating in surveys tend to underestimate revenue. We have also observed that drivers who concentrate on serving the airport often have lower revenues than other drivers who have learned how to maximize their income by serving a variety of areas, often developing a personal base of clients. Compared to a survey of airport drivers, the estimates in this study are based on eight months of real data coming directly from the in-vehicle equipment of more than half the taxi drivers in Chicago. This data is far more representative and statistically accurate than a small survey of drivers serving one specialized submarket of Chicago.

DRIVER TURNOVER

One revelation of the CMT data is that there is substantial turnover among drivers in the Chicago taxi industry, and that those who quit do so relatively early in their tenure as a taxi driver. Nearly 20% of the more than 8,000 drivers in the CMT data set worked 15 days or fewer before ceasing to drive. (Since the data set extended only to August 31, 2013, only drivers who started prior to August 1 were included in this calculation in order to provide enough time to determine if the driver would leave the industry within a three to four-week period.)

While many of these short tenure drivers made very little money—more than 50% had average gross fare revenue of less than \$100 per day, which would leave them only \$15 or \$20 in net daily earnings after paying the lease fee and fuel costs—a significant portion made relatively good earnings. In fact, more than 20% of the short tenure drivers generated average daily gross revenues at least equal to the median gross earnings of longer term drivers (those working for at least a month). Yet despite this relative success economically, they ceased driving within three weeks of beginning the job. It is very likely, therefore, that the overall working conditions of the job of taxi driving, not just its financial compensation, are a significant factor in causing many individuals to decide that it is not a job they wish to perform.

It also bears emphasizing that even for taxi drivers who do not quit early in their tenure, there is still substantial turnover over a longer period of time. In the CMT data set, there were 5,782 drivers who each worked a minimum of 20 days during the eight-month period and were observed in the data set over a period of at least 30 days duration. These drivers' activities and revenue generating performance were the focus of our analysis. However, these drivers represented only 5% of all of the drivers who appeared in the data set—the others left the job prior to reaching these very modest duration benchmarks. Viewed from another perspective, of the approximately 5,000 taxi drivers in the CMT data set who worked during August 2013, only 30% had been driving at the beginning of the year in January 2013; moreover, 16% of the August drivers had been driving for two months or less.

These turnover statistics show that taxi driving is a relatively long-term job for only a minority of the individuals who work as a taxi driver. The statistics also show that most drivers who do remain in the job for some period of time are apparently able to master it within a few weeks of beginning work. After drivers have worked at least a full month, there is absolutely no correlation between how long they have driven and the compensation level they achieve.

4 THE TAXI COST AND FARE RATE MODEL

In the course of this study, one of the consulting team members, Taxi Research Partners, developed an Excel-based spreadsheet model that the City can use to estimate the impact of changes to fare rates or other policy changes, including changes to permitted lease rates. It can also be used to estimate driver incomes in the future as one element of considering possible fare rate adjustments. The model and a user manual for it have been provided to BACP.

The model divides drivers into groups depending on whether they are medallions or lease drivers, and how many hours they work. Because of the differences in revenue and costs associated with these variations, it was decided that separate analyses and net incomes would need to be conducted for the following groups of drivers.

Figure 4-1 Taxi Driver Groups

| Driver Groups | Avg. Hours/Day | % of Drivers |
|-------------------------------|----------------|--------------|
| 1. Part-Time Lease Diver | 5.7 hours | 15% |
| 2. Full-Time Lease Driver | 9.0 hours | 62% |
| 3. Extended-Time Lease Driver | 12.8 hours | 13% |
| 4. Full-Time Owner Operators | 9.0 hours | 10% |

MODEL INPUT AND ASSUMPTIONS

The model has a set of inputs that collectively describe how drivers work (hours and days driven), the number and length of trips they are able to serve, typical amounts of waiting time that is accrued on the meter, and factors that determine operating costs, including whether drivers lease or own, whether lease drivers lease daily or weekly and for 12 or 24 hours, the percentage of airport trips served, the percentage of credit card trips, vehicle ownership costs and fuel economy, fuel prices, insurance costs, and so forth. As delivered to the City, the model has current values for all of these factors, but they can all be adjusted to represent future conditions or future policy changes, for example changes to authorized meter rates or lease rates that might be under consideration at some time. The model allows for drivers to be grouped into categories based on number of hours typically worked (part-time, full-time, and extended-time).

For purposes of estimating annual income, the model assumes 50 weeks worked per year, typical driver working hours, and typical costs. Drivers working greater numbers of hours are able to spread fixed costs over greater numbers of miles and make progressively more per driven mile. Drivers working fewer hours make proportionately less per driven mile for the same reason.

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The model follows a progressive logic reflecting data input, its calculation, and output. Inputs collectively describe the type of service provided by the driver. Primary inputs include:

- Current gasoline and CNG fuel prices
- Operating hours calculated from electronic data
- Trip distance and patterns from electronic data
- Current lease costs
- Current Chicago taxi fare rate
- Insurance costs, fees to app providers, and airport fees,
- Vehicle types in use, fuel type, and vehicle efficiencies

The application of the model, defined as a model run will take account of current measured costs entered at the point of application. A detailed review of the model run is set out in the model manual that has been provided to BACP. A sample of the main model page allowing for user input is shown in Figure 4-2.

Figure 4-2 Sample of Model Inputs

| Chicago cost model base statistics | User entry in white cells only | |
|---|--------------------------------|---------------|
| | Value | Unit |
| Driver Operating Hours | | |
| Part Time | 5.72 | Hours per day |
| Full Time | 9 | Hours per day |
| Extended Time | 12.83 | Hours per day |
| Days driven per week | | |
| Part Time | 5.35 | Days per week |
| Full Time | 5.63 | Days per week |
| Extended Time | 5.81 | Days per week |
| Trip Statistics | | |
| Part Time | 7.52 | trips per day |
| Full Time | 12.45 | trips per day |
| Extended Time | 16.42 | trips per day |
| Paid Miles per Trip | | |
| Part Time | 4.8 | per trip |
| Full Time | 4.28 | per trip |
| Extended Time | 4.1 | per trip |

MODEL OUTPUTS

The output of the model includes:

- Average **annual revenue** for each driver group and for the entire set of drivers
- Average of **annual costs** incurred by each driver group and for the entire set of drivers
- Average of annual **net income** for each driver group and the entire set of drivers

Model outputs can be used to identify the average income across driver groups, including changes in potential earnings over time. Differences in earning potential over time provide a consistent calculated basis for fare change, taking account of changes in the costs of operation and the nature of demand/supply.

The model can also be used to set baselines for future analysis, and we recommend that this baseline be reset at each fare review, regardless of whether a fare adjustment is considered necessary or not.

Figure 4-3 shows a sample of the model's output for part-time, full-time, and extended-time drivers who have 12-hour daily leases. The model produces similar results for drivers with 24-hour and weekly leases, and for owner-drivers.

The price elasticity of demand may also be used to identify impacts of changes to taxi rates, but was not in the scope of this study. In general, fare increases lead to some drop in demand, which would dilute the gains to drivers from a fare increase.

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Figure 4-3 Sample Output from the Taxi Cost and Fare Rate Model

| Typical Annual Costs / Income | Part Time Lease Driver | Full Time Lease Driver | Extended Hours Lease Driver |
|--|------------------------|------------------------|-----------------------------|
| Label | B1 | B2 | B3 |
| Hours driven / day | 6 | 9 | 13 |
| Hours driven / week | 31 | 51 | 75 |
| Days Driven per week | 6 | 6 | 6 |
| Lease Category | 12h Daily | 12h Daily | 12h Daily |
| Vehicle Purchase | N/A | N/A | N/A |
| Lease Costs | \$21,300.00 | \$21,300.00 | \$21,300.00 |
| Vehicle Maintenance cost | N/A | N/A | N/A |
| Medallion Finance Cost | N/A | N/A | N/A |
| Insurance Costs | N/A | N/A | N/A |
| Chauffeur Annual License Renewal | \$8.00 | \$8.00 | \$8.00 |
| Medallion Annual License Renewal | N/A | N/A | N/A |
| Inspection Fees | N/A | N/A | N/A |
| Fees to smart phone dispatch app providers | \$335.30 | \$646.40 | \$795.09 |
| Fuel Costs | \$1,812.27 | \$3,185.03 | \$3,750.73 |
| Airport Fee | \$144.03 | \$517.99 | \$886.27 |
| TOTAL COSTS | \$23,599.60 | \$25,657.42 | \$26,740.09 |
| Flag Pull | \$6,537.70 | \$12,603.34 | \$15,502.53 |
| Distance charges | \$17,702.08 | \$29,472.43 | \$35,298.07 |
| Time charges | \$3,597.54 | \$6,152.88 | \$7,630.41 |
| Extras | \$1,703.62 | \$4,189.70 | \$4,037.50 |
| Tips (If included) | \$5,908.19 | \$10,483.67 | \$12,493.70 |
| TOTAL INCOME | \$35,449.13 | \$62,902.02 | \$74,962.23 |
| Take Home Earnings (Income less Cost) | \$11,849.53 | \$37,244.60 | \$48,222.14 |
| Approximate Hourly Wage | \$7.74 | \$14.70 | \$12.94 |
| Approximate Daily Wage | \$39.50 | \$124.15 | \$160.74 |

APPENDIX A

Chicago Taxi Driver Survey

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The City of Chicago is evaluating taxi services in the city. As part of this process, the City would like to hear from taxi drivers. The survey will take about 3 minutes to complete. Your responses will be kept COMPLETELY CONFIDENTIAL.

Each driver should fill out one survey only. If you have already filled out this survey once, you do not need to do it again.

1. Do you own your own cab?

- Yes
 No

2. Do you regularly drive the same cab?

- Yes
 No

3. In which year did you purchase your cab?

Year of purchase (figures only)

4. In which year are you likely to replace your cab?

Replacement Year (figures only)

5. What is the make and model of your cab?

- Toyota Camry
- Toyota Prius
- Ford Escape
- Toyota XB
- Nissan Altima
- Ford Crown Victoria
- Dodge Caravan
- Chevrolet Impala
- VPG MV-1
- Dodge Grand Caravan
- Mercury Grand Marquis
- Toyota Sienna
- Hyundai Sonata
- Ford C-Max
- Toyota Rav4

Other (please specify)

6. What is the model year of your cab?

Model Year (figures only)

7. What type of fuel does your cab use?

- Gasoline
- Gasoline-Hybrid
- Natural Gas (CNG)
- E85 (Ethanol/gas-flexfuel)

Other (please specify)

8. Is your cab able to carry a wheelchair?

- Yes
- No

9. What parts have you replaced in the last 12 months? Please list parts and numbers replaced. e.g.: Tires - 4

| | |
|----|----------------------|
| 1 | <input type="text"/> |
| 2 | <input type="text"/> |
| 3 | <input type="text"/> |
| 4 | <input type="text"/> |
| 5 | <input type="text"/> |
| 6 | <input type="text"/> |
| 7 | <input type="text"/> |
| 8 | <input type="text"/> |
| 9 | <input type="text"/> |
| 10 | <input type="text"/> |

10. How many days a week do you drive a cab?

- 1
- 2
- 3
- 4
- 5
- 6
- 7

11. How many hours a day on average do you usually drive?

12. In a typical day, how many trips do you carry?

Number

13. How many miles PER DAY do you usually drive on your shift?

- Less than 50
- 50 - 74
- 75 - 99
- 100 - 124
- 125 - 149
- 150 - 174
- 175 or more

14. Which of the following do you pay? (Please click all appropriate)

- Medallion Finance Costs
- Vehicle Finance Costs
- Insurance Costs
- Maintenance Costs

Other (please specify)

15. On average, how much do you spend on fuel PER DAY (\$)

Fuel Cost \$

16. How much do you pay for insurance (\$) Enter amount in appropriate box

Daily

Weekly

Monthly

Annually

None of the above

17. Please tell us what other costs you pay in running a cab and their approximate amount; e.g.: Radio fees - \$2000 / month

1

2

3

4

5

18. Do you receive any additional income from your cab? e.g.: Rental from a family member as second driver. Please state how much (\$)

Additional \$

19. The next questions relate to taxi Apps. You can review your previous answers by choosing 'go back', or move to app questions by choosing 'continue'

- Go Back
- Continue

20. What is the make and model of your cab?

- Toyota Camry
- Toyota Prius
- Ford Escape
- Toyota XB
- Nissan Altima
- Ford Crown Victoria
- Dodge Caravan
- Chevrolet Impala
- VPG MV-1
- Dodge Grand Caravan
- Mercury Grand Marquis
- Toyota Sienna
- Hyundai Sonata
- Ford C-Max
- Toyota Rav4

Other (please specify)

21. What is the model year of your cab?

Model Year

22. What type of fuel does your cab use?

- Gasoline
- Gasoline-Hybrid
- Natural Gas (CNG)
- E85 (Ethanol/gas-flexfuel)

Other (please specify)

23. Is your cab able to carry a wheelchair?

- Yes
- No

24. Do you lease your vehicle?

- Yes
- No

25. How much do you pay for your lease? (\$ - please enter once only)

Daily lease - for 12 hour period

Daily lease - for 24 hour period

Weekly lease - allows 12 hours / day

Weekly lease - allows 24 hours / day

26. How many days a week do you drive a cab?

- 1
- 2
- 3
- 4
- 5
- 6
- 7

27. How many hours a day on average do you usually drive?

28. In a typical day, how many trips do you carry?

Number

29. On average, how much do you spend on fuel PER DAY (\$)

Fuel Cost \$

30. How many miles PER DAY do you usually drive on your shift?

- Less than 50
- 50 - 74
- 75 - 99
- 100 - 124
- 125 - 149
- 150 - 174
- 175 or more

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The following questions ask you about Smartphone Apps

31. Do you work with an online or mobile app company? (check all applicable)

- Hailo
- Uber
- Other

Other (please specify)

32. If you do work with an online or mobile app provider, what percent of your trips are through these app providers:

| | |
|-------|---|
| Hailo | <input style="width: 100%; height: 15px;" type="text"/> |
| Uber | <input style="width: 100%; height: 15px;" type="text"/> |
| Other | <input style="width: 100%; height: 15px;" type="text"/> |

33. What percent of your metered fare or flat fee do you pay to the app provider?

%

Thank you for taking part in our work. We appreciate your time.