

A MAXIMUM LIKELIHOOD METHOD WITH PENALTY TO ESTIMATE
LINK TRAVEL TIME BASED ON TRIP ITINERARY DATA

A Thesis

by

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ABSTRACT

Travel time is an important network performance measure. It is a challenging subject due to the fluctuations in traffic characteristics, such as traffic flow. This study proposes a maximum likelihood method with penalty to estimate link travel time based on trip itinerary data from a statistical point. Three penalized models, which are Lasso penalized model, Ridge penalized model and Revised-Lasso penalized model, are introduced. The models are discussed and compared with the basic model which is a maximum likelihood function without penalty. First, the predictive performance of the basic model and three penalized models are evaluated based on the data of three simulated networks. Results suggest that Revised-Lasso penalized model outperforms other models. In this research, Revised-Lasso penalized model is applied to a simplified Sioux Falls network. This study also provides a detailed procedure to estimate link travel time parameters in the simplified Sioux Falls network. Finally, the effect of the sample size on estimation accuracy is tested. The results show that sample size has a significant effect on the basic model estimation, but it has little effect on the Revised-Lasso penalized model estimation. This study provides an efficient and accurate way to estimate link travel time distribution.

DEDICATION

To my father,Bo Zhong and my mother, Lihua Yan.

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TABLE OF CONTENTS

	Page
ABSTRACT	ii
DEDICATION	iii
ACKNOWLEDGEMENTS	iv
TABLE OF CONTENTS	v
LIST OF FIGURES.....	vii
LIST OF TABLES	viii
CHAPTER I INTRODUCTION	1
1.1 Problem Statement	4
1.2 Research Tasks.....	4
1.3 Thesis Organization	5
CHAPTER II LITERATURE REVIEW.....	7
2.1 Reviews of Travel Time Estimation Study	7
2.2 Reviews of Maximum Likelihood	14
2.3 Reviews of Penalized Function.....	15
CHAPTER III MODEL DESCRIPTION AND ALGORITHM.....	17
3.1 Model Description.....	17
3.2 Estimation of Mean Travel Time	20
3.3 Estimation of Link Travel Time Variance	21
CHAPTER IV MODEL VALIDATION	24
4.1 Data Collection.....	24
4.2 Test Networks Description.....	26
4.3 Estimation Results.....	29
4.4 Sioux Falls Network Test and Results	41
4.5 Effect of Sample Size on Estimation	48

CHAPTER V APPLICATION.....	53
5.1 Application Problem Description.....	53
5.2 Model Application	54
5.3 Application Results Analysis	57
CHAPTER VI CONCLUSIONS AND DISCUSSIONS	58
REFERENCES	61
APPENDIX A	64
APPENDIX B	67
APPENDIX C	68
APPENDIX D	73
APPENDIX E.....	77
APPENDIX F	90
APPENDIX G	92
APPENDIX H	104

LIST OF FIGURES

	Page
Figure 1. Travel Time on DMS in Portland, Oregon	2
Figure 2. Chicago Travel Times on Web	2
Figure 3. The Procedure of Data Collection Method	25
Figure 4. Standard Deviation Estimation Comparison in the 10-link Network	34
Figure 5. Standard Deviation Estimation Comparison in the 20-link Network	36
Figure 6. Standard Deviation Estimation Comparison in the 50-link Network	38
Figure 7. Simplified Sioux Falls Network with 27 Links	42
Figure 8. Sample Size Effect on RMSE	51
Figure 9. Sample Size Effect on MAPE.....	52
Figure 10. Simulation of Selected Network in College Station	54

LIST OF TABLES

	Page
Table 1. Trip-Link Matrix in the 10-link Network.....	26
Table 2. Real Mean and Standard Deviation in the 10-link Network	27
Table 3. Observed Trip Itinerary in the 10-link Network	27
Table 4. Real Mean and Standard Deviation in the 20-link Network	28
Table 5. Real Mean and Standard Deviation in the 50-link Network	28
Table 6. Mean Estimation Result in the 10-link Network.....	30
Table 7. Mean Estimation Result in the 20-link Network.....	31
Table 8. Mean Estimation Result in the 50-link Network.....	31
Table 9. Standard Deviation Estimation Result in the 10-link Network.....	33
Table 10. Standard Deviation Estimation Result in the 20-link Network.....	35
Table 11. Standard Deviation Estimation Result in the 50-link Network.....	37
Table 12. Improved Rate of Penalized Models	39
Table 13. OD Selected in the Sioux Falls Network	43
Table 14. Real Mean and Standard Deviation in the Sioux Falls Network.....	43
Table 15. Mean Estimation Result in the Sioux Falls Network	44
Table 16. Standard Deviation Estimation Result in the Sioux Falls Network	44
Table 17. Mean Estimation Results (Second)	46
Table 18. λ and BIC	47
Table 19. Standard Deviation Estimation Results (Second)	47

Table 20. Mean Estimation Results of 27 trips observed.....	48
Table 21. Standard Deviation Estimation Results of 27 trips observed.....	49
Table 22. RMSE and MAPE of Basic Model and Revised-Lasso Penalized Model by Reducing the Number of Observed Trips	50
Table 23. Estimation Results in the Application.....	57

CHAPTER I

INTRODUCTION

Travel time as an important measure to evaluate the traffic network performance has attracted much research and practice attention in recent years. It is one of the most significant parts of network management and it is a critical piece of information for intelligent transportation systems (1). Specially, travel time information contributes to the identifications of bottlenecks in the traffic network and allows planners to manage the traffic operations. Accurate travel time estimation can help improve the efficiency of individual travels and give supportive information to maximize network efficiency. In short, for private drivers, transportation researchers and transportation planners and operators, travel time is likely to be one of the most critical information (2).

Traffic congestion is a big problem in many metropolitan areas in the United States and around the world. More and more infrastructures and methods have become available for travel time monitoring. Specifically, intelligent transportation systems (ITS) has been widely-used to provide real-time travel time information to the public. Figure 1 shows a dynamic message sign (DMS) installed by the Oregon Department of Transportation (ODOT) and Figure 2 provides an example of real-time travel time on the Chicago highway network displaying on the web (3).



Figure 1. Travel Time on DMS in Portland, Oregon (Source: http://web.pdx.edu/~bertini/papers/A6_55_Kothuri_paper.pdf)



Figure 2. Chicago Travel Times on Web (Source: <http://www.travelmidwest.com>)

The estimated travel times shown on the board or website provide information for travelers. A number of studies have attempted to develop approaches to estimate travel time using advanced technologies: video image processing, automatic vehicle identification, cellular phone tracking, probe vehicles, etc.(4). The advanced surveillance systems can be divided into two categories: fixed sensors and mobile sensors. A loop detector is a typical fixed sensor and it is widely used in travel time estimation, which provides traffic information at discretized point locations. Mobile sensor, such as probe vehicles equipped with GPS, provides snapshot data of a vehicle, including time stamp, position coordinate and instantaneous velocity. Direct measurement of a vehicle's travel time is possible with mobile sensors.

However, there are limitations in the aforementioned travel time information collection methods. With fixed sensors, data is very limited because it can only be collected in sparse locations. With mobile sensors, data often shows long-distance information and it does not reveal the link traffic condition and management level directly. So another method is to estimate travel time using finite dataset, which is a challenging task because travel time is uncertain and sensitive to many factors. Travel time fluctuates according to traffic demand, road conditions, weather, human driving behaviors and traffic controls at signalized intersections, etc. Especially in the urban traffic network, it is more difficult to estimate travel time than on a freeway because signal controls and pedestrians always interrupt traffic flow.

Therefore, developing methods to implement reliable travel time estimation for a network when only having partial network traffic information is significant.

Furthermore, it is necessary to get link travel time instead of trip travel time to disseminate more detailed information to the public and to help the traffic managers assess traffic conditions more clearly.

1.1 Problem Statement

The purpose of this study is to find an efficient and accurate algorithm to estimate link travel time based on available trip itinerary data through a study network. Each observed trip starts from a node (origin) and ends at a node (destination) with a specific route, called an itinerary. Trip itineraries are observed for a long period of time on a network, and the link travel time is, therefore, assumed to follow normal distribution in this research. Meanwhile, it is assumed that each link travel time distribution is independent. The maximum likelihood estimation (MLE) is applied to predict the parameters of link travel time distribution from a statistical point. A basic framework was proposed by Yin et al. (5). This study proposes advanced models by incorporating a penalized function to improve the estimation accuracy. The objectives of this study is to develop an accurate and efficient way to estimate the parameters of link travel time distribution. The proposed models and methods are validated through network simulations.

1.2 Research Tasks

The main goal of the thesis is to estimate link travel time distribution accurately and efficiently using trip itinerary data in a given network. Based on a basic estimation framework developed by Yin et al. (5), advanced models are proposed and a solution

algorithm is developed. The research plan and specific tasks for this thesis are listed below:

- To introduce the problem of travel time estimation with various methods and their applications.
- To describe the basic link travel time estimation framework and propose advanced models and algorithms.
- To simulate several networks and generate data for analysis.
- To compare estimation results calculated from the advanced models and from the basic model.
- To check the effects of sample size on the estimation accuracy.
- To apply the models to a real network and give a detailed description of the estimation procedure.
- To apply the maximum likelihood method and the penalty method to estimate the parameters in an application.

1.3 Thesis Organization

Six chapters make up this thesis. Chapter I is the introduction, which includes the background of travel time estimation history, problem statement, research objectives and thesis organization. Chapter II is a literature review of previous research, which describes the travel time estimation methods and development. This chapter also introduces the basic theoretical methods used in the thesis. Chapter III presents the methodology used to estimate the parameters of link travel time distributions and then provides a detailed algorithm to solve the models based on the methodology. Chapter IV

presents link travel time estimation results, compares the results and also tests the effects of sample size on estimation accuracy. Chapter V documents an application. Chapter VI presents the conclusions and the discussions of the thesis, which includes the contributions and limitations of the research, as well as suggestions for future study.

CHAPTER II

LITERATURE REVIEW

This chapter reviews the previous studies regarding travel time estimation. It first introduces estimation models and data collection methods with comments on their strengths and weaknesses. Then it provides a literature review focusing on MLE and the penalty method.

2.1 Reviews of Travel Time Estimation Study

Researchers have focused on travel time estimation for many years. The proposed methodologies are multiple and sophisticated for various estimation purposes. Data acquisition methods are diverse as well. The following is a brief review regarding travel time estimation methods.

With the development of technology and science, many advanced techniques have been employed in managing transportation systems, controlling traffic signals and recording traffic data, such as electronic distance-measuring instruments, computerized and video license plate matching, cellular phone tracking, automatic vehicle identification and automatic vehicle location (6). These technologies provide traffic data to researchers to estimate travel time.

Inductance loops are the most widely used traffic detectors among all surveillance systems (6). They usually provide traffic data about traffic flow, speed and occupancy. Oh et al. (6) pointed out a deficiency of point measurements obtained from loop detectors in estimating travel times. They proposed a theoretically sound and

practically applicable travel time estimation algorithm using loop detector data. The section density obtained by observing traffic flows between two point detection stations was the kernel of the estimation algorithm with corrections for detector errors. Furthermore, they evaluated the method via both simulated data and real traffic data. Zhang et al. (7) proposed a straight-forward and computationally efficient method to predict freeway travel times using a linear model. They applied the method to two actual loop detector data sets, whose prediction errors ranged from 5% to 10% and 8% to 13%. The model was evaluated and proved to be straightforward to implement with available freeway sensor data. Chu et al. (8) developed an improved travel time estimation method by applying Adaptive Kalman Filtering (AKF) that fused point detection data and probe vehicle data. They evaluated the proposed model under both recurrent and non-recurrent congestion using microscopic simulation. The results showed that the algorithm significantly improved section travel time estimation. It was also able to work with the erratic point detector data and model errors.

Probe vehicles are considered a high-fidelity method to collect ground-truth travel time information since their entire journeys from start to end are fully recorded. Li and McDonald (9) put forward a new approach to estimate travel time by using single probe vehicle based on the analysis of the speed-time profile. The driving pattern of a probe vehicle was classified by using fuzzy sets. Maximum continuous acceleration (MCA) and average speed of the probe vehicle were taken as the input variables of fuzzy sets. Travel time was calculated by different equations for corresponding driving patterns. The estimation results were encouraging according to a range of performance

tests. Jula et al. (10) developed a mathematical model to predict travel times along the arcs and estimate arrival times at the nodes of a stochastic and dynamic network in real time. The travel time estimator was developed based on the method of Kalman filter. The model was simple and robust to estimate the travel times along the arcs and arrival times at the node. Zheng and Van Zuylen (11) developed a three-layer neural network model to estimate complete link travel times for individual probe vehicle traversing the link based on the data collected by probe vehicles. They compared the proposed model with an analytical estimation model developed by Hellinga et al. (12). The results with simulated data showed that the analytical model could be widely used on the paper, but practical use may be difficult because of the needed parameters. Methods proposed by probe vehicle data can estimate the travel time in dynamic networks, which makes the estimation more complicated.

GPS can locate the position of the vehicle and track its path, and serve as the real-time probe in the traffic network (13). Zhan et al. (13) proposed a new way to predict hourly link travel time in the urban traffic network using the large-scale taxicab data. The data they used were limited since they only knew the origin and the destination of each trip, and trip travel time and distance of a trip without the exact trajectory. In the proposed model, a path taken was treated as a latent, and then a reasonable path set was constructed. A multinomial logistic regression (MNL) model was used to calculate the probability that a driver chooses a path. And link travel times were estimated by minimizing the least squared difference between expected path travel times and observed path travel times. The proposed model was tested using large-scale data from Midtown

Manhattan, New York. The results showed that the model was able to estimate hourly average link travel times efficiently. Ygnace et al (14) evaluated the feasibility of using cell phones as traffic probes for the bay area network. Their study results showed that cellular positioning techniques can be used to estimate travel times accurately.

Many methods have been developed to estimate trip travel time or network travel time based on the loop data and probe vehicle data. GPS equipment can provide detailed information for link travel time estimation. More and more research has been dedicated to estimating link travel time. The expansion of intelligent transportation systems (ITS) have provided an alternative direction that uses the most suitable traffic data to directly measure travel time (15).

Automated Vehicle Identification (AVI) data from recording of the vehicles toll tags or video license plate matching is a case for measuring travel time. Link travel time can be obtained directly by matching the vehicle ID at different locations on the highway (16). Park et al. (17) took advantage of AVI data obtained from the Houston Transtar system to compare the performances of two proposed ANN models in forecasting multiple-period freeway link travel times. Link travel times from the AVI system were used as a test bed and that data provided the results showing that the modular ANN outperformed the conventional singular ANN. Soriguera et al. (16) also used the AVI data, which monitored the AP-7 toll highway, near Barcelona, Spain to indicate the suitability of a new approach for calculating the travel time on highways. The method was able to predict single section travel times and estimate the exit time at each junction. Through this method, all the required itinerary travel times could be calculated even the

observations were few. Furthermore, Ohba et al. (18) also developed a method to calculate travel time information using AVI data, where unusual data were removed and travel time data were very few. The unusual data in their study referred to travel time, which was extremely long or extremely short, which kept it from following a given distribution. After removing these data, the proposed model was applied to estimate travel time, and the model was verified by field data.

In addition to the data obtained from advanced techniques, many different types of data were employed in travel time prediction. Mohamed et al. (19) proposed a framework to solve the travel time estimation problem when the sample size of probe vehicles were insufficient or the number of fixed sensors were inadequate, and they estimated link travel times even when there were ‘untraveled’ links. They used two types of data: historical link travel time data and online travel time data from neighborhood links; furthermore, they applied a data fusion scheme to make use of both types of data. The proposed framework was validated using real-life data from the City of Vancouver, British Columbia. They compared the estimation accuracy and demonstrated the feasibility of using neighbor links data.

Besides the models presented above, other kinds of methodologies, such as time series models (20) and neural network-based models (20) were applied to predict highway travel time. To take advantage of traffic volume and signal timing data, regression methods (4; 21; 22) and heuristic methods (23; 24) were used to do the travel time estimation based on the known dataset.

While the advanced systems are able to provide observed data, considered as the fundamental of forecasting travel times, many limitations, such as inadequate sample size or sparse number of fixed sensors, prevent them giving enough information. For example, although probe vehicle are widely used for estimating travel time estimation, only limited sample points at fragmented times can be collected due to labor costs (25). Available data from existing infrastructure cannot be fully utilized due to data amount and accuracy. Another problem has to do with the fact that cameras perform poorly in bad weather. Adequate data are rarely collected to estimate travel time in a dynamic circumstance. Like the AVI system, it can only provide partial sensor coverage and only taking advantage of this type of data, it cannot estimate ‘untraveled’ links in the network.

Predicting travel time is a challenging and significant issue not only because it is hard to obtain sufficient data, but because travel time is easily affected by the traffic environment and human factor. Due to fluctuations in traffic demand, supply, travel control, arrivals and departures at signalized intersections (11), travel times are unstable and change at different times of the day. Even in the same time interval and on the same link, different vehicles have very different travel times.

A model developed by Yeon et al. (26) was used to estimate a freeway travel time using Discrete Time Markov Chains (DTMC) regardless of congestion. A stochastic process for estimating travel time was given and five tasks were decided for completion. Because of the congestion situation, they first defined system states and state variables considering the probability of congestion for a link and then estimated

travel time of each link both when it was non-congested or congested. According to DTMC theory, transition matrices were used to calculate the route travel time. The method was applied to the US 202 highway in Philadelphia, and the results showed that the model matched field travel time estimates very well, with deviations of less than 3%. Oh et al. (6) aimed at forecasting travel time under congested traffic conditions, especially during incidents. The algorithm they used was inspired by the hydrodynamic kinematic traffic model. By reconstructing the data set, the method was able to estimate accurate travel times, which was evaluated by the simulated data on a section of the I-405 freeway in Irvine, California.

Travel time estimation on the arterials, which contain signalized intersections, is more complicated because of some factors such as signal control and pedestrian movement. Skabardonis et al. (27) presented an analytical model to estimate the travel time on arterial streets concerning signal controllers. They employed the kinematic wave theory to model the queuing at signalized intersections. Liu et al. (25) proposed a model to estimate arterial travel time by tracing a virtual probe vehicle along an OD route with 11 intersections. They provided a real-time arterial data collection and archival system developed at the University of Minnesota. It used an innovative algorithm for time-dependent arterial travel time estimation based on the archived data. Also, Bhasker et al. (1) presented a methodology to estimate the average travel time on signalized urban networks. The method they proposed incorporated probe vehicle data into traditional cumulative plots, and the results showed that the integrated performance was better than methods based on a single data source.

The present study focuses on the link travel time estimation based on the network information, in particular, trip origin/destination information with trajectory and associated departure and arrival time. Some researches (9; 11; 13) related to link travel time estimation have proposed corresponding models on link travel time estimation. In this research, estimation models are proposed using the maximum likelihood method and the penalty method.

2.2 Reviews of Maximum Likelihood

Maximum likelihood is one of the most important developments in 20th century statistics (28). Maximum-likelihood is a method to estimate the parameters of a statistical model. If a data set is applied and a statistical model is given, the model parameters can be estimated using maximum likelihood function. A sample $x_1, x_2, x_3, \dots, x_n$ is supposed to be n independent and identically distributed observations, which comes from an unknown probability density function $f_0(\cdot)$. $f_0(\cdot)$ belonging to the family $\{f(\cdot|\theta), \theta \in \Theta\}$. An estimator $\hat{\theta}$ which would be as close to the true value θ_0 as possible must be determined. The maximum likelihood function is shown below:

$$L(\theta; x_1, \dots, x_n) = f(x_1, \dots, x_n | \theta) = \prod_{i=1}^n f(x_i | \theta) \quad [1]$$

In this case, trip travel times make up the data set that will be applied into the maximum likelihood function thereby allowing link travel time in the given network to be estimated.

2.3 Reviews of Penalized Function

The model of link travel time estimation is supposed to be a high-dimensional and ill-posed problem in this study. The regularization or shrinkage method can be used to overcome the problem resulting from maximum likelihood procedure to prevent overfitting (29). A penalty relating to parameters of the objective function is applied to the optimization problems.

The types of penalty are widely used. One is L_1 norm penalty on parameters, which is called ‘least absolute shrinkage and selection operator’ (Lasso) (30). The other is L_2 norm penalty on regression coefficients, which is called ridge regression (31). If a

linear regression model $y_i = \sum_{j=1}^p x_{ij}\beta_j + \varepsilon_i$ is applied, then the form of the penalty

function is:

$$\beta = \arg \min_{\beta} \left\{ \sum_i \left(y_i - \sum_{j=1}^p x_{ij}\beta_j \right)^2 \right\} + P_{\lambda}(\beta) \quad [2]$$

The simplified form of the penalty is $p_{\lambda}(\beta) = \lambda \sum_j |\beta|^m$, where $\lambda \geq 0$. When the power m equals to 1, it is called Lasso penalty, and when the power m equals to 2, it is called Ridge penalty. The form of penalty is decided according to different problems and data. Yuan et al. (32) proposed an efficient algorithm for group variable selections and the proposed algorithm with penalty showed superior performance to the traditional elimination method.

Therefore, this study focuses on link travel time estimation in a given network from a statistical point. Maximum likelihood method and the penalty method will be

imposed in the estimation model. The following chapter introduces the proposed models and the algorithms.

CHAPTER III

MODEL DESCRIPTION AND ALGORITHM

The purpose of the thesis is to propose an algorithm to estimate the parameters of link travel time distribution based on the trip itinerary information in the given network. From the statistical view point, maximum likelihood function is used to develop the basic model in the previous research (5). In this section, the advanced models with penalty known as the Lasso penalized model, Ridge penalized model and Revised-Lasso penalized model are introduced to predict link travel time, and a solution algorithm is developed to calculate the value of the mean and standard deviation of link travel time.

3.1 Model Description

3.1.1 Problem and Assumptions

In a given transportation network, consisting of a node set and an arc set, traffic continuously enter and exit over a period of time. The itinerary of each trip is recorded according to four vital pieces of information: departure location, arrival location, departure time and arrival time. For simplicity, the route information for each trip is recorded as well. In other words, the set of fixed route that the itinerary covers is known. We further assume a travel time distribution for each link, which is a normal. Meanwhile, every link travel time is independent, and it has no effect on the other link travel times. We further assume that the itinerary records are large enough to estimate the link travel times. The condition for sufficiency is not discussed.

3.1.2 Model Description

Every link travel time meets normal distribution and as a consequence, the trip travel time follows normal distribution as well. The travel time probability density function of link a_n is:

$$t(x, \mu_{a_n}, \sigma_{a_n}) = \frac{1}{\sigma_{a_n} \sqrt{2\pi}} e^{-\frac{(x-\mu_{a_n})^2}{2\sigma_{a_n}^2}} \quad [3]$$

where

μ_{a_n} is the mean travel time along the link a_n ;

σ_{a_n} is the travel time standard deviation along the link a_n ;

$\sigma_{a_n}^2$ is the travel time variance along the link a_n .

To estimate the parameters for each link, the maximum likelihood function is applied. Each observed trip is composed of several links. The trip travel time set is denoted as X, expressed as $\{x_1, x_2, x_3, \dots, x_n\}$, and the link set in the network is denoted as A, expressed as $\{a_1, a_2, a_3, \dots, a_n\}$. For example, if trip 3 is composed of link 1, link 2, link 4 and link 6, it will be expressed as $x_3 = x_{3a_1} + x_{3a_2} + x_{3a_4} + x_{3a_6}$. According to the definition of maximum likelihood method and the purpose of the study, the maximum likelihood function is:

$$\text{Maximize } L(\theta; x_1, \dots, x_m) = \prod_{i=1}^m f(x_i | \theta) \quad [4]$$

where

x_i is the observed itinerary travel time of trip i ;

m is the number of observed trips;

θ is the parameters for normal distribution.

As the probability function is normal distribution probability function, the maximum likelihood function based on the collected data is as:

$$\text{Maximize } L(X | \mu, \alpha) = \prod_i^m \frac{1}{\sqrt{2\pi}\sigma_i} e^{-\frac{(x_i - \mu_i)^2}{2\sigma_i^2}} \quad [5]$$

where

μ_i is the mean travel time along the trip i ;

σ_i is the travel time standard deviation along the trip i .

Therefore, in accordance with the features of the normal distribution and the characteristics of the maximum likelihood, a log-minimum function of link travel time estimation is shown below. It is the basic model for this thesis.

$$\text{Minimize } LL(X | \mu, \alpha) = \sum_i^m \left(\log \left(\sum_{a_n}^n \delta_{i,a_n} \sigma_{a_n}^2 \right) + \frac{1}{\sum_{a_n}^n \delta_{i,a_n} \sigma_{a_n}^2} \left(x_i - \sum_{a_n}^n \delta_{i,a_n} \mu_{a_n} \right)^2 \right) \quad [6]$$

In the function, δ_{i,a_n} is a binary variable, which indicates whether link a_n is taken in trip i . When the link is taken, the value of δ_{i,a_n} is 1; otherwise, its value is 0. Under these circumstances, the value of δ_{i,a_n} is known in the given network due to the recorded known routes.

3.2 Estimation of Mean Travel Time

The general method to solve the maximum likelihood function is to get the derived equations. In order to estimate the parameters, which are the means of link travel time, take the partial derivative for a specific link a_r with respect to its parameter μ_{a_r} .

All trips traversing link a_r are extracted to take a partial derivative. The objective function leads to the following equation:

$$\sum_i^m \left(\frac{\delta_{i,a_r}}{\sum_{a_n} \delta_{i,a_n} \sigma_{a_n}^2} (x_i - \sum_{a_n} \delta_{i,a_n} \mu_{a_n}) \right) = 0 \quad [7]$$

3.2.1 Proof of Mean Travel Time Stability

A previous study (5) has proven that mean travel time is not sensitive to the estimates of variance in use. This finding for the mean estimates helps predict mean values easily. Linear equations [7] can be solved if the variance values are assigned.

3.2.2 Solution Algorithm

According to the proof described above, the accuracy of the mean estimates is not sensitive to the variance estimates if the given variance is within a certain range of its true value. In order to estimate mean link travel time, we start with an initial set of travel time standard deviations to be used in equation [7]. It is easy to transform the functions to a linear form when the σ_{a_n} are given initial values. Mean link travel time is obtained through solving the linear system of equations. The estimation results is the final mean estimates of link travel time.

3.3 Estimation of Link Travel Time Variance

According to the log-minimum likelihood function, it can be taken as a partial derivative with respect to σ_{a_r} regarding specific link a_r . The objective function (6) gives rise to the following equation:

$$\sum_i^m \left(\frac{\delta_{i,a_r}}{\sum_{a_n}^n \delta_{i,a_n} \sigma_{a_n}^2} - \frac{\delta_{i,a_r}}{\left(\sum_{a_n}^n \delta_{i,a_n} \sigma_{a_n}^2 \right)^2} (x_i - \sum_{a_n}^n \delta_{i,a_n} \mu_{a_n})^2 \right) = 0 \quad [8]$$

Mean link travel time estimates have been obtained by solving the linear equations [7]. Even though applying the mean estimates into equation [8], link travel time standard deviation is difficult to solve due to this nonlinear equation system and the large number of variables.

Because of this solution difficulty, we estimate the link travel time standard deviation by optimizing the objective function instead of solving the nonlinear equations [8]. However, the number of variables would be very large when considering a large network with many links. There are two observations in the model. One is that not all the variables to be estimated are significant in the objective function which means the value of some standard deviations may be zero. The second is that a large network has too many parameters to be estimated. Over-fitting is a modeling error and will occur when a model is complex, such as having too many parameters relative to the number of observations. It will cause poor predictive performance. Thus, a method is needed to make function regularization and to obtain more accurate estimates.

We apply the penalized regression method to the maximum likelihood function. In mathematics and statistics, it is also called regularization, which refers to a process of

introducing additional information in order to solve an ill-posed problem or to prevent over-fitting (29).

As an example, if a linear regression model $y_i = \sum_{j=1}^p x_{ij}\beta_j + \varepsilon_i$ is applied, then the form of the penalty function is equation [2] introduced in Section 2.3:

$$P_\lambda(\beta) = \lambda \sum_j |\beta_j|^m \quad [9]$$

Equation [9] is an example, simplified form of the penalty and $\lambda \geq 0$. When the power m equals to 1, the penalty is called ‘Lasso penalty’; and when the power m equals to 2, the penalty is called ‘Ridge penalty’.

The two kinds of penalties are applied to the maximum likelihood function. The objective function is to minimize the log-likelihood function plus a penalty function. Specifically, the penalty variable in the model is link travel time variance. The constraints are that the variances are nonnegative. Thus, the general form of penalized log-minimum objective function with constraints is shown below:

$$\begin{aligned} \text{Minimize } M(X|\beta) &= \sum_i L(\beta_i) + \sum_i P_\lambda(\beta_i) \\ \beta_i &\geq 0, i = 1, 2, \dots, n \end{aligned} \quad [10]$$

Lasso penalized model and Ridge penalized model are considered in this study. Of special interest is Lasso penalized model shown in equation [11]:

$$\begin{aligned} \text{Minimize } LM(X|\alpha) &= \sum_i^m \left(\log \left(\sum_{a_n}^n \delta_{i,a_n} \sigma_{a_n}^2 \right) + \frac{1}{\sum_{a_n}^n \delta_{i,a_n} \sigma_{a_n}^2} (x_i - \mu_i)^2 \right) + \lambda \sum_i^m \left| \sum_{a_n}^n \delta_{i,a_n} \sigma_{a_n}^2 \right| \\ \sigma_{a_n}^2 &\geq 0, a_n = 1, 2, \dots, n \end{aligned} \quad [11]$$

Ridge Penalized model is as follows:

$$\begin{aligned} \text{Minimize } RM(X|\alpha) &= \sum_i^m (\log(\sum_{a_n}^n \delta_{i,a_n} \sigma_{a_n}^2) + \frac{1}{\sum_{a_n}^n \delta_{i,a_n} \sigma_{a_n}^2} (x_i - \mu_i)^2) + \lambda \sum_i^m (\sum_{a_n}^n (\delta_{i,a_n} \sigma_{a_n}^2)^2) \\ &\sigma_{a_n}^2 \geq 0, a_n = 1, 2, \dots, n \end{aligned} \quad [12]$$

The penalized models are mainly used to estimate the variance (σ^2) of link travel time. According to the feature of standard deviation in the model, another form of penalized model is proposed, referred to as Revised-Lasso penalized function, which has variance in the denominator.

$$\begin{aligned} \text{Minimize } RLM(X|\alpha) &= \sum_i^m (\log(\sum_{a_n}^n \delta_{i,a_n} \sigma_{a_n}^2) + \frac{1}{\sum_{a_n}^n \delta_{i,a_n} \sigma_{a_n}^2} (x_i - \mu_i)^2) + \lambda \sum_i^m \left| \sum_{a_n}^n \delta_{i,a_n} \frac{1}{\sigma_{a_n}^2} \right| \\ &\sigma_{a_n}^2 \geq 0, a_n = 1, 2, \dots, n \end{aligned} \quad [13]$$

λ is the smoothing parameter in the penalized model. It is considered to be a known parameter. Changing the value of λ causes a slight change of the estimates. Before optimizing the model, the value of λ is given. Several methods are used to decide the value of λ , such as cross-validation, Akaihe information criterion (AIC), and Bayesian information criterion (BIC) (29). Different criteria apply to different cases.

The estimates resulting from three penalized models, Lasso penalized model [11], Ridge penalized model [12] and Revised-Lasso penalized model [13] with the basic model [6] are compared in the model validation.

CHAPTER IV

MODEL VALIDATION

This chapter presents the process of model validation. It is organized into five sections as follows. First, we introduce the data collection method before network validation. Second, three networks are simulated according to the data collection method, including 10 links, 20 links and 50 links, respectively. Third, we give the link travel time estimation results from the three networks. We also compare the results of Lasso penalized model [11], Ridge penalized model [12], Revised-Lasso penalized model [13] and the basic model [6]. In the fourth section, we apply Revised-Lasso penalized model to a typical transportation network, the simplified Sioux Falls network. We present a detailed estimation process based on the simulated trip itineraries information in the network. In the end, we test the effect of sample size on the accuracy of the estimation.

4.1 Data Collection

The simulated network data is generated by the following steps shown in Figure 3:

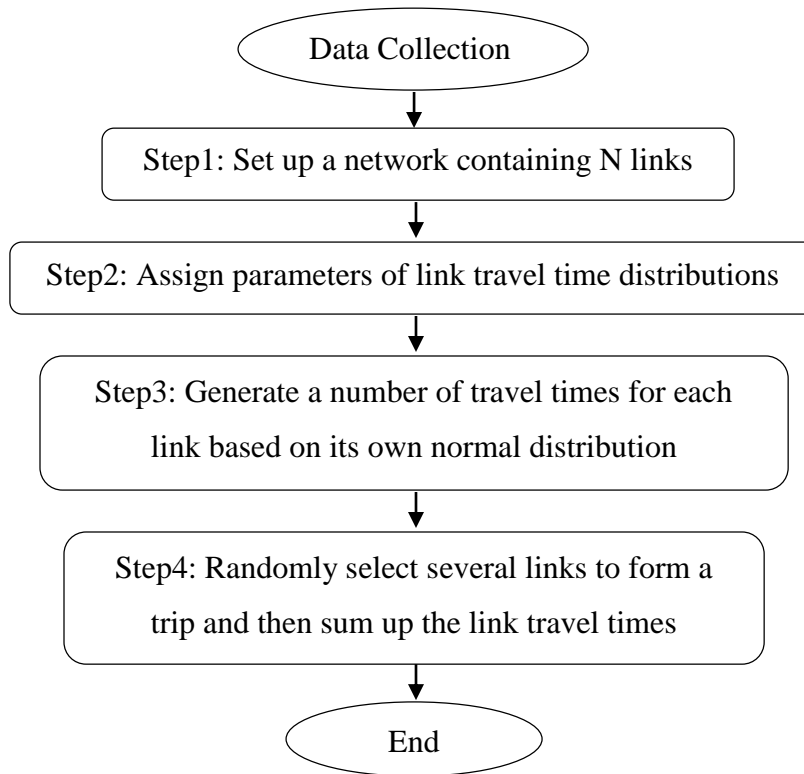


Figure 3. The Procedure of Data Collection Method

In the first step, N is the variable for the number of links in the network. In the second step, the parameters of each link travel time distribution are assigned. In order to make every link travel time positive, the assigned mean and standard deviation are carefully examined and controls are taken to keep the probability of generating negative link travel times relatively small. In the third step, 150 travel times are generated for each link in order to ensure a large enough sample size. Examinations are required afterwards. If a generated link travel time is negative, a positive link travel time will be generated to replace the negative one till all of the 150 link travel times are positive. In

the fourth step, one or several links are randomly selected to form a trip in the designed N-link network. Because each link has 150 generated travel times, 150 travel times for any trip are obtained by simply summing up the travel times of selected links. The steps of data generation procedure is coded in MATLAB.

4.2 Test Networks Description

Three networks are used for the test: a 10-link network, a 20-link network and a 50-link network. The description of each network is presented below sequentially.

4.2.1 10-link Network

In the 10-link network, 10 trips are observed with known routes and 150 trip itineraries are recorded for each trip. Table 1 illustrates the trip route information.

Table 1. Trip-Link Matrix in the 10-link Network

Link#	1	2	3	4	5	6	7	8	9	10
Trip1	1	0	1	0	0	1	0	1	0	0
Trip2	1	0	1	1	1	1	0	0	1	1
Trip3	0	1	0	0	0	0	0	0	0	1
Trip4	0	0	1	1	0	0	1	1	0	0
Trip5	0	0	0	0	0	0	0	1	1	0
Trip6	0	0	0	1	0	0	1	1	0	1
Trip7	1	1	0	0	0	1	0	1	1	1
Trip8	0	0	0	1	0	0	0	0	0	0
Trip9	0	1	1	1	1	1	1	1	1	0
Trip10	1	1	1	1	1	1	1	1	1	1

In Table 1, 1 represents that the link is taken in the trip; otherwise, 0 means that the link is exclude from the trip. For example, in trip 2, link 1, link 2 to link 6, link 9 and link 10 are taken.

Table 2. Real Mean and Standard Deviation in the 10-link Network

Link#	1	2	3	4	5	6	7	8	9	10
Mean	39	32	30	42	44	42	41	45	36	42
S.D.	5	1	6	3	10	7	10	9	2	3

Table 2 shows the means and standard deviations assigned for each link in the 10-link network. There is no specific unit for the generated numbers and estimates. Table 3 shows the partial trip itinerary data. There is no specific unit for the trip travel times as well. All of the data is endorsed in APPENDIX A.

Table 3. Observed Trip Itinerary in the10-link Network

Trip#	TT1	TT2	TT3	TT4	TT5	TT6	.....
1	142.38	152.41	176.51	175.63	164.32	163.07	.....
2	261.28	258.61	286.63	274.95	269.93	260.21	.....
3	76.83	77.33	78.08	78.68	70.31	72.12	.....
4	163.87	140.18	166.35	181.14	148.68	146.78	.....
5	70.83	82.42	95.20	95.82	78.44	90.56	.....
6	175.81	165.10	180.04	190.58	171.14	159.07	.....
7	220.41	243.44	259.02	255.48	250.08	242.56	.....
8	45.43	44.39	41.72	40.27	44.98	37.94	.....
9	301.33	275.85	339.73	338.92	301.57	289.58	.....
10	380.26	366.99	414.81	414.00	387.76	371.78	.....

4.2.2 20-link Network

In the 20-link network, 20 trips are observed with known routes and 150 trip itineraries are recorded for each trip. The trip-link matrix is in APPENDIX B.

Similar to the description for the 10-link network, Table 4 presents the assigned parameters data and the observed trip itinerary data is endorsed in APPENDIX C.

Table 4. Real Mean and Standard Deviation in the 20-link Network

Link#	1	2	3	4	5	6	7	8	9	10
Mean	55	45	52	40	47	50	43	48	52	46
S.D.	10	4	2	7	9	7	5	6	9	3
Link#	11	12	13	14	15	16	17	18	19	20
Mean	58	34	60	53	49	45	35	40	52	51
S.D.	1	7	10	9	6	7	8	3	6	7

4.2.3 50-link Network

In the 50-link network, 50 trips are observed with known routes and 150 travel times are recorded for each trip. Table 5 includes the parameters of link travel time distribution assigned in the data collection. The trip-link matrix and trip itinerary data are attached in APPENDIX D and APPENDIX E.

Table 5. Real Mean and Standard Deviation in the 50-link Network

Link#	1	2	3	4	5	6	7	8	9	10
Mean	55	45	52	40	47	50	43	48	52	46
S.D.	10	4	2	7	9	7	5	6	9	3

Table 5. Continued

Link#	11	12	13	14	15	16	17	18	19	20
Mean	58	34	60	53	49	45	35	40	52	51
S.D.	1	7	10	9	6	7	8	3	6	7
Link#	21	22	23	24	25	26	27	28	29	30
Mean	34	53	59	39	45	59	60	41	47	45
S.D.	4	1	2	6	6	1	2	7	5	8
Link#	31	32	33	34	35	36	37	38	39	40
Mean	47	30	32	52	39	33	36	37	44	39
S.D.	7	6	3	8	5	3	6	4	1	6
Link#	41	42	43	44	45	46	47	48	49	50
Mean	31	53	40	57	59	44	57	32	40	48
S.D.	2	3	7	4	10	9	1	3	7	8

4.3 Estimation Results

According to the data of the three networks, comparisons of the estimation results among the basic model, Lasso penalized model, Ridge penalized model and Revised-Lasso penalized model provide the evidence to decide the best model to predict the parameters of link travel time distributions in this section.

4.3.1 Mean Link Travel Time Estimation Result

The mean of the link travel time estimated from the four models are the same. The mean estimates of the 10-link network, 20-link network and 50-link network are shown in Table 6, Table 7 and Table 8, respectively.

Table 6. Mean Estimation Result in the 10-link Network

	Real Mean	Estimated Mean
Link1	39	39.45
Link2	32	32.05
Link3	30	30.06
Link4	42	42.15
Link5	44	44.31
Link6	42	41.62
Link7	41	41.49
Link8	45	44.89
Link9	36	36.18
Link10	42	42.09
RMSE=0.28		MAPE=0.56%

To evaluate the performance of model estimation, two performance indicators, root mean squared error (RMSE) and mean absolute percentage error (MAPE) are considered to quantify the performance.

$$RMSE = \sqrt{\frac{1}{n} \sum_{i=1}^n (t_{es,a_n} - t_{tr,a_n})^2} \quad [14]$$

$$MAPE = 100 \times \frac{1}{n} \sum_{i=1}^n \left| \frac{t_{es,a_n} - t_{tr,a_n}}{t_{tr,a_n}} \right| \quad [15]$$

where

t_{es,a_n} is the estimated mean travel time of link a_n ;

t_{tr,a_n} is the true (assigned) mean travel time of link a_n .

RMSE and MAPE of mean link travel time estimation in the 10-link network are 0.28 and 0.56%, respectively. Table 7 and Table 8 display the mean estimation results of the 20-link network and the 50-link network.

Table 7. Mean Estimation Result in the 20-link Network

	R.M.	E.M.		R.M.	E.M.
Link1	55	55.18	Link11	58	58.00
Link2	45	44.73	Link12	34	34.03
Link3	52	51.90	Link13	60	59.73
Link4	40	40.51	Link14	53	54.37
Link5	47	45.50	Link15	49	49.02
Link6	50	49.05	Link16	45	44.62
Link7	43	43.75	Link17	35	35.35
Link8	48	47.99	Link18	40	40.19
Link9	52	53.91	Link19	52	52.54
Link10	46	45.80	Link20	51	50.98
RMSE=0.72			MAPE=1.00%		

R.M. is the abbreviation of real mean and E.M. is the abbreviation of estimated mean.

Table 8. Mean Estimation Result in the 50-link Network

	R.M.	E.M.		R.M.	E.M.		R.M.	E.M.
Link1	55	55.18	Link18	40	40.19	Link35	39	38.65
Link2	45	44.73	Link19	52	52.54	Link36	33	32.74
Link3	52	51.90	Link20	51	50.98	Link37	36	36.17
Link4	40	40.51	Link21	34	33.86	Link38	37	36.39
Link5	47	45.50	Link22	53	53.16	Link39	44	43.85
Link6	50	49.05	Link23	59	59.09	Link40	39	39.57
Link7	43	43.75	Link24	39	39.23	Link41	31	31.10
Link8	48	47.99	Link25	45	44.87	Link42	53	52.62
Link9	52	53.91	Link26	59	59.02	Link43	40	40.83
Link10	46	45.80	Link27	60	59.93	Link44	57	57.15

Table 8 Continued

	R.M.	E.M.		R.M.	E.M.		R.M.	E.M.
Link11	58	58.00	Link28	41	41.51	Link45	59	58.17
Link12	34	34.03	Link29	47	46.88	Link46	44	43.54
Link13	60	59.73	Link30	45	45.20	Link47	57	56.97
Link14	53	54.37	Link31	47	47.60	Link48	32	31.93
Link15	49	49.02	Link32	30	30.18	Link49	40	40.01
Link16	45	44.62	Link33	32	32.11	Link50	48	48.25
Link17	35	35.35	Link34	52	52.42			
RMSE=0.53			MAPE=0.78%					

Obviously, the mean estimation results fit the true means very regardless of the network size. Both the basic model and the penalized models can all estimate the means of link travel times based on the trip itineraries data efficiently and accurately.

4.3.2 Link Travel Time Standard Deviation Estimation Result

Unlike the mean link travel time estimation, which has the same results as the models (the basic model and the three penalized models), link travel time standard deviation estimation is more complex and difficult. The standard deviation estimation from the four models are different. Interior point method is used to solve the estimation problem, which is a method to solve the nonlinear program with constraints. The optimization procedure is operated by MATLAB.

Table 9 presents the link travel time standard deviation estimates in the 10-link network.

Table 9. Standard Deviation Estimation Result in the 10-link Network

	Real S.D.	Estimated S.D. Basic	Estimated S.D. Lasso $\lambda=0.3520$	Estimated S.D. Ridge $\lambda=0.0003$	Estimated S.D. Revised-Lasso $\lambda=0.0855$
Link1	5	6.05	4.50	5.47	5.34
Link2	1	3.19	0.02	1.10	2.57
Link3	6	6.22	5.80	7.21	6.51
Link4	3	2.84	2.82	2.86	2.84
Link5	10	10.12	7.41	7.57	9.59
Link6	7	5.89	5.06	6.46	6.57
Link7	10	8.94	6.57	8.93	9.03
Link8	9	8.06	7.48	6.79	7.77
Link9	2	0.02	1.10	4.41	2.14
Link10	3	1.22	3.37	3.24	2.25
RMSE		1.28	1.64	1.41	0.79
MAPE		44.50%	27.97%	23.97%	24.27%

The two indicators of RMSE and MAPE are also calculated in the link travel time standard deviation estimation. For the results from the basic model, the RMSE and MAPE of link travel time standard deviation estimation in the 10-link network are 1.28 and 44.50%, respectively.

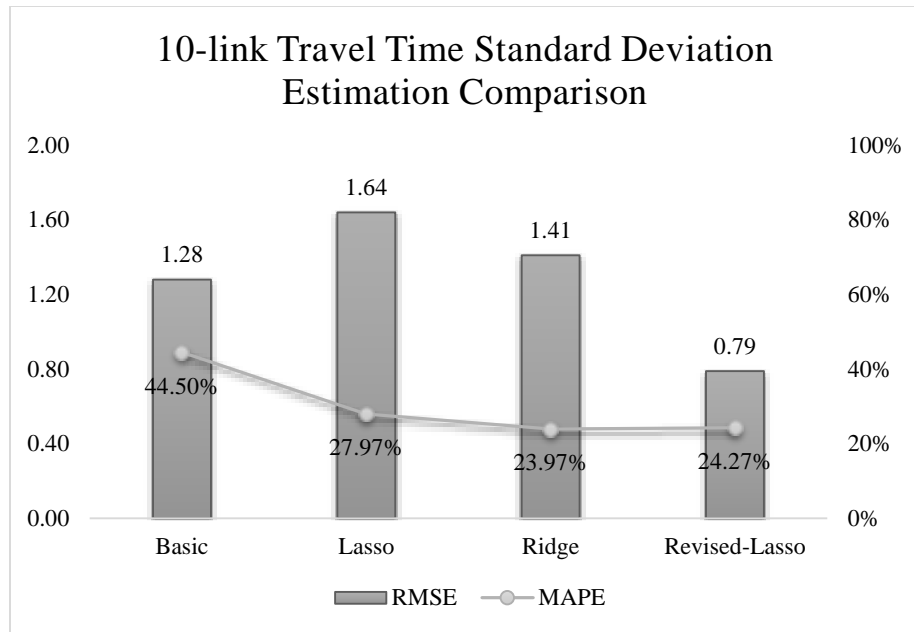


Figure 4. Standard Deviation Estimation Comparison in the 10-link Network

In the 10-link network, compared with the estimation results from basic model, the RMSEs of Lasso penalized model and Ridge penalized model are higher, with the value of 1.64 and 1.41, respectively (see Figure 4). The RMSE of Revised-Lasso, however, goes down to 0.79. But for the MAPE, the values of the penalized models are all smaller than that of the basic model.

Table 10. Standard Deviation Estimation Result in the 20-link Network

	R.S.D.	E.S.D. Basic	E.S.D. Lasso $\lambda=0.0401$	E.S.D. Ridge $\lambda=0.0049$	E.S.D. Revised-Lasso $\lambda=0.0010$
Link1	10	9.13	8.86	6.32	9.26
Link2	4	7.06	4.40	5.01	6.90
Link3	2	0.14	0.05	5.18	1.90
Link4	7	10.09	6.01	5.27	10.08
Link5	9	12.34	12.41	5.78	12.24
Link6	7	10.76	6.73	5.81	10.69
Link7	5	4.28	8.00	5.67	4.15
Link8	6	9.45	6.32	5.91	9.38
Link9	9	10.26	0.05	5.37	10.28
Link10	3	2.91	2.91	3.16	2.91
Link11	1	0.02	1.15	5.24	0.98
Link12	7	9.25	9.42	5.75	9.19
Link13	10	9.97	10.33	5.46	9.92
Link14	9	9.75	8.28	5.71	9.81
Link15	6	3.73	7.39	5.44	3.51
Link16	7	4.15	5.69	5.51	4.12
Link17	8	8.37	8.30	6.65	8.37
Link18	3	0.02	0.05	5.62	0.89
Link19	6	0.03	6.05	5.59	1.00
Link20	7	6.07	8.10	5.60	6.20
RMSE		2.53	2.52	2.42	2.31
MAPE		41.82%	28.24%	52.21%	30.17%

R.S.D is the abbreviation of real standard deviation and E.S.D. is the abbreviation of estimated standard deviation.

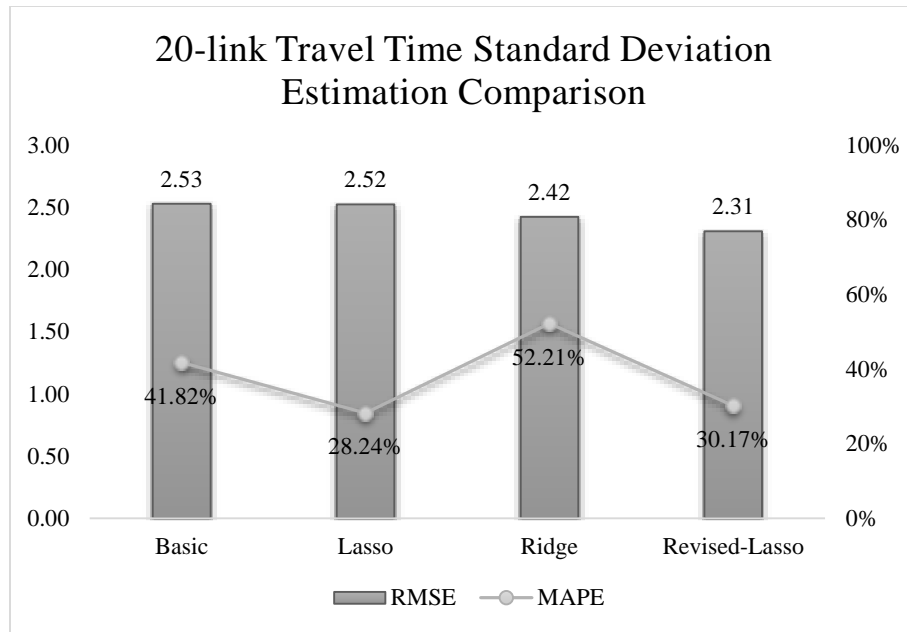


Figure 5. Standard Deviation Estimation Comparison in the 20-link Network

Table 10 presents the link travel time standard deviation estimates in the 20-link network. RMSE and MAPE of the basic model is 2.53 and 41.82% (see Figure 5). Compared with the basic model estimation results, the RMSEs of the other three penalized models are smaller but with small differences. The MAPEs of Lasso penalized model and Revised-Lasso penalized model decrease to 28.24% and 30.17%, respectively. However, the Ridge penalized model gives a worse estimation on link travel time standard deviation than the basic model because the MAPE increases to 52.21%.

Table 11. Standard Deviation Estimation Result in the 50-link Network

	R.S.D.	E.S.D. Basic	E.S.D. Lasso $\lambda=0.0090$	E.S.D. Ridge $\lambda=0.1393$	E.S.D. Revised-Lasso $\lambda=0.0006$
Link1	10	11.65	11.75	3.35	11.15
Link2	4	3.93	3.93	2.93	3.93
Link3	2	0.10	0.09	2.95	1.03
Link4	7	0.12	0.10	3.02	1.07
Link5	9	11.19	10.84	3.05	11.88
Link6	7	9.52	8.66	2.73	8.75
Link7	5	4.95	4.28	2.89	5.68
Link8	6	5.32	2.04	2.65	7.50
Link9	9	7.46	7.36	2.82	9.58
Link10	3	0.37	2.09	2.80	7.92
Link11	1	0.52	1.39	2.98	1.27
Link12	7	7.08	6.93	2.86	9.56
Link13	10	10.16	9.35	2.79	7.82
Link14	9	5.21	5.94	3.02	6.95
Link15	6	7.97	8.77	3.10	8.20
Link16	7	3.97	6.96	3.00	2.19
Link17	8	12.79	10.23	2.72	12.03
Link18	3	4.96	5.59	2.75	4.68
Link19	6	0.15	0.23	2.50	1.37
Link20	7	8.51	7.95	3.11	8.83
Link21	4	4.46	1.98	3.13	6.17
Link22	1	4.54	1.13	2.69	2.65
Link23	2	0.09	0.09	2.71	1.06
Link24	6	7.11	7.42	2.82	7.75
Link25	6	8.88	8.75	2.78	7.77
Link26	1	1.24	4.91	2.75	1.95
Link27	2	1.34	1.94	3.05	2.26
Link28	7	0.98	1.50	2.93	6.95
Link29	5	6.44	4.83	2.68	3.87
Link30	8	0.81	5.24	3.05	6.26
Link31	7	0.10	0.12	3.01	1.15
Link32	6	12.48	11.28	3.06	10.83
Link33	3	4.86	5.09	2.72	4.08
Link34	8	0.48	0.17	2.75	3.42
Link35	5	0.11	0.12	2.89	1.25
Link36	3	3.21	1.58	2.61	2.42

Table 11 Continued

	R.S.D.	E.S.D. Basic	E.S.D. Lasso $\lambda=0.0090$	E.S.D. Ridge $\lambda=0.1393$	E.S.D. Revised-Lasso $\lambda=0.0006$
Link37	6	0.12	0.30	2.83	3.93
Link38	4	6.53	5.13	2.78	3.02
Link39	1	0.16	0.18	2.97	1.53
Link40	6	8.46	7.39	2.95	6.01
Link41	2	0.17	0.14	2.73	1.93
Link42	3	0.11	0.14	3.00	1.34
Link43	7	4.98	5.41	2.90	5.20
Link44	4	8.30	8.55	2.77	2.73
Link45	10	14.18	12.76	3.12	12.13
Link46	9	9.21	9.94	3.17	8.73
Link47	1	0.06	0.06	2.76	0.89
Link48	3	0.08	0.08	2.85	1.33
Link49	7	5.21	5.97	3.15	3.55
Link50	8	6.98	6.62	3.07	7.51
RMSE		3.37	3.08	3.63	2.49
MAPE		58.85%	55.80%	60.78%	40.82%

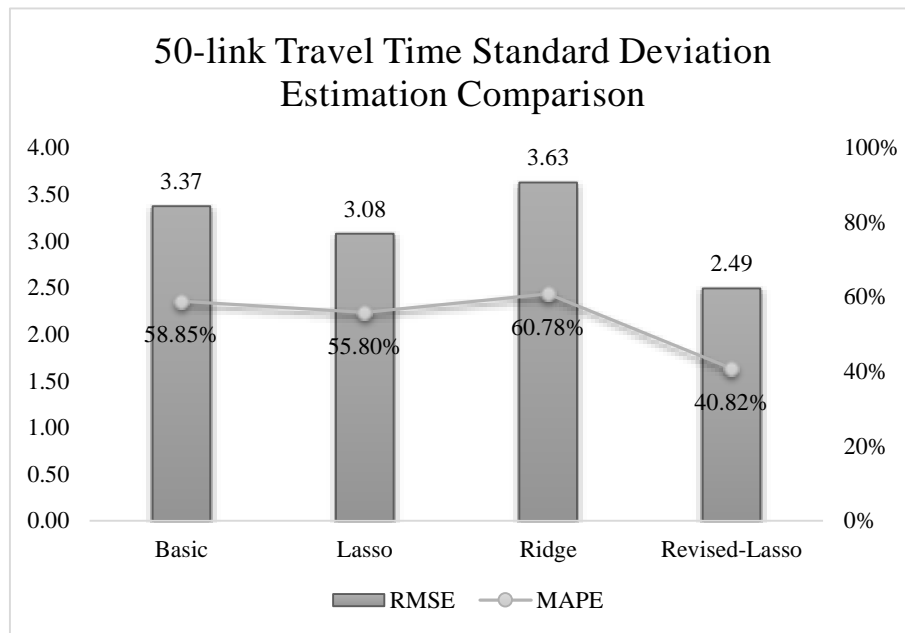


Figure 6. Standard Deviation Estimation Comparison in the 50-link Network

Table 11 presents the link travel time standard deviation estimates in the 50-link network. RMSE and MAPE of the basic model is 3.37 and 58.85% (see Figure 6). The estimation of Ridge penalized model is worse than the basic model because the values of the indicators are higher than those of basic model. The RMSEs of Lasso penalized model and the Revised-Lasso penalized model result in smaller values, 3.08 and 2.49, respectively. The MAPEs of Lasso penalized model and Revised-Lasso penalized model decrease to 55.80% and 40.82%, respectively.

4.3.3 Estimation Result Analysis

From the results shown above, the estimation on the mean link travel time performs very well no matter how large the network is. However, there is a significant difference in the standard deviation estimation results between the basic model and the penalized models. Compared with the estimates of the basic model, improved rates, which are the number in the brackets, on the standard deviation estimation of the three penalized models are recorded in Table 12.

Table 12. Improved Rate of Penalized Models

		Basic	Lasso	Ridge	Revised-Lasso
10-link	RMSE	1.28	1.64 (-28.13%)	1.41 (-10.16%)	0.79 (38.28%)
	MAPE	44.50%	27.97% (37.15%)	23.97% (46.13%)	24.27% (45.46%)
20-link	RMSE	2.53	2.52 (0.23%)	2.42 (4.22%)	2.31 (8.72%)
	MAPE	41.82%	28.24% (32.47%)	52.21% (-24.86%)	30.17% (27.84%)

Table 12. Continued

		Basic	Lasso	Ridge	Revised-Lasso
50-link	RMSE	3.37	3.08 (8.80%)	3.63 (-7.51%)	2.49 (26.16%)
	MAPE	58.85%	55.80% (5.18%)	60.78% (-3.28%)	40.82% (30.63%)

Table 12 shows the improved rates of Lasso penalized model, Ridge penalized model and Revised-Lasso penalized model against the basic model. If the rate is positive, it indicates that the estimation results are better than the results from basic model; otherwise, the estimation results are worse. We rate the model performance as better estimation when the improved rates of the two indicators are both positive. For Lasso penalized model, the standard deviation estimation results are better than the basic model results in the 20-link network and 50-link network. However, in the 50-link network, the improved rate is not significant, only 8.80% in RMSE and 5.18% in MAPE. For Ridge penalized model, the standard deviation estimation results are worse than the basic model results in the three networks. Especially in the 50-link network, the performance of estimation is worse with the changing rate of -7.51% in RMSE and -3.28% in MAPE. It is not suitable to use the Ridge penalty to estimate the standard deviation in this study due to the penalty form in Ridge penalized model. Revised-Lasso penalized model gives a better estimation than the basic model results in the three networks, whose estimates are close to the real values. Even in the 50-link network, where the estimation is much more complex and difficult, the improved rates are 26.16% in RMSE and 30.63% in MAPE.

Both Lasso penalized model and Revised-Lasso penalized model have better estimation results than the basic model. Revised-Lasso penalized model is selected to estimate link travel time in the following study, because it has efficient and accurate estimation performances in any network. Revised-Lasso penalized model is validated in a typical transportation test network and used to test the effect of sample sizes on the accuracy of estimation.

4.4 Sioux Falls Network Test and Results

In the previous tests, the networks and observed trips are simulated with no graphic demonstration of any network. When generating observed trips, the trip connections are not considered. It is difficult to make sure that all the observed trips are link-connected in the given network. Therefore, a simplified Sioux Falls network, which excludes several links from the typical one, is used to validate the model.

This section contains two tasks. The first task is to estimate the parameters of link travel time distribution using the basic model and Revised-Lasso penalized model, similar to the estimation procedure in the previous sections. The second task is to estimate the parameters of link travel time distribution using Revised-Lasso penalized model according to the trip origin/destination data in the real world without comparison with true parameters.

4.4.1 Simplified Sioux Falls Network Description

The typical Sioux Falls network contains 76 links. In this study, however, several links are deleted from the network to make it composed of 54 links. Because all of the

links are non-directional, the number of links is 27. The network pattern is shown in Figure 7.

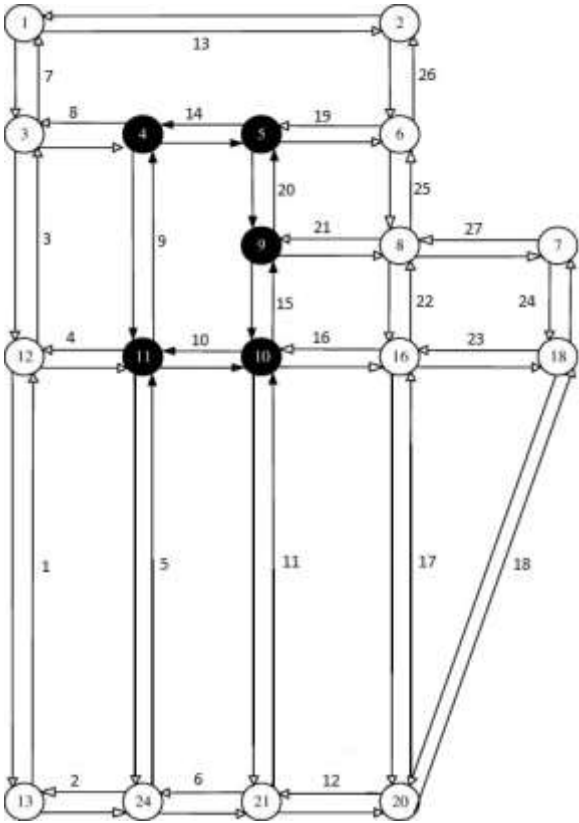


Figure 7. Simplified Sioux Falls Network with 27 Links

The trip-link matrix is generated manually to make sure that each trip is connected as shown in Table 13. 45 trips are observed with known routes and 150 travel times for each trip are recorded. The trip itineraries information is endorsed in APPENDIX F and APPENDIX G.

Table 13. OD Selected in the Sioux Falls Network

Trip#	OD	Trip#	OD	Trip#	OD	Trip#	OD	Trip#	OD
1	13-7	10	18-12	19	13-14	28	4-19	37	1-7
2	11-16	11	3-8	20	16-18	29	16-15	38	12-6
3	4-13	12	13-9	21	7-9	30	13-2	39	13-4
4	1-18	13	4-16	22	4-14	31	10-5	40	16-1
5	12-7	14	11-7	23	3-13	32	5-15	41	3-16
6	14-6	15	1-8	24	11-16	33	5-18	42	3-15
7	14-2	16	7-14	25	5-19	34	2-5	43	2-12
8	15-8	17	18-2	26	13-18	35	2-11	44	1-11
9	19-9	18	12-19	27	12-11	36	6-19	45	1-19

4.4.2 Revised-Lasso Penalized Model Validation

The first task is to validate Revised-Lasso penalized model using generated data. As the algorithm described above, the mean and standard deviation are estimated based on the assigned data. Table 14 contains the mean and standard deviation generated in this network.

Table 14. Real Mean and Standard Deviation in the Sioux Falls Network

Link#	1	2	3	4	5	6	7	8	9
Mean	41	47	45	47	30	32	52	39	33
S.D.	7	5	8	7	6	3	8	5	3
Link#	10	11	12	13	14	15	16	17	18
Mean	36	37	44	39	31	53	40	57	59
S.D.	6	4	1	6	2	3	7	4	10
Link#	19	20	21	22	23	24	25	26	27
Mean	44	57	32	40	48	44	48	36	43
S.D.	9	1	3	7	8	6	6	2	1

Table 15. Mean Estimation Result in the Sioux Falls Network

	R.M.	E.M.		R.M.	E.M.		R.M.	E.M.
Link1	41	41.51	Link10	36	36.17	Link19	44	43.54
Link2	47	46.88	Link11	37	36.39	Link20	57	56.97
Link3	45	45.20	Link12	44	43.85	Link21	32	31.93
Link4	47	47.60	Link13	39	39.57	Link22	40	40.01
Link5	30	30.18	Link14	31	31.10	Link23	48	48.25
Link6	32	32.11	Link15	53	52.62	Link24	44	43.89
Link7	52	52.42	Link16	40	40.83	Link25	48	48.32
Link8	39	38.65	Link17	57	57.15	Link26	36	35.95
Link9	33	32.74	Link18	59	58.17	Link27	43	42.88
RMSE=0.38				MAPE=0.69%				

Table 15 presents the mean link travel time estimates. According to the values of the two indicators, the mean estimation results are close to the real values. The standard deviation estimates of the basic model are compared with the estimates of Revised-Lasso penalized model. Table 16 shows the link travel time standard deviation estimates. The improved rates of Revised-Lasso penalized model are 20% in RMSE and 19.71% in MAPE.

Table 16. Standard Deviation Estimation Result in the Sioux Falls Network

	R. S. D.	E.S.D. Basic	E.S.D. Revised- Lasso $\lambda=0.099$		R. S. D.	E.S.D. Basic	E.S.D. Revised- Lasso $\lambda=0.099$
Link1	7	6.76	6.39	Link16	7	7.50	7.59
Link2	5	4.29	4.39	Link17	4	3.88	3.45
Link3	8	7.94	8.15	Link18	10	8.87	8.87
Link4	7	6.78	6.77	Link19	9	10.07	10.07

Table 16. Continued

	R. S. D.	E.S.D. Basic	E.S.D. Revised- Lasso $\lambda=0.099$		R. S. D.	E.S.D. Basic	E.S.D. Revised- Lasso $\lambda=0.099$
Link5	6	4.94	5.03	Link20	1	2.16	1.97
Link6	3	4.38	4.25	Link21	3	2.18	2.05
Link7	8	8.72	8.89	Link22	7	7.26	7.31
Link8	5	6.58	6.13	Link23	8	7.78	7.78
Link9	3	4.03	4.45	Link24	6	4.92	4.64
Link10	6	5.53	5.40	Link25	6	7.14	7.04
Link11	4	0.11	1.76	Link26	2	0.64	2.01
Link12	1	0.07	1.92	Link27	1	2.27	2.39
Link13	6	5.61	5.04				
Link14	2	0.06	1.93	RMSE		1.20	0.96
Link15	3	2.29	2.45	MAPE		33.34%	26.77%

4.4.3 Parameters Estimation

This section describes the link travel time estimation procedure with no comparison with real values. The case study network is the simplified Sioux Falls network mentioned before. 45 trips with known routes are observed. For each trip, 150 trip itineraries are recorded for a long period of time. According to the test results given above, only Revised-Lasso penalized model is considered to estimate the parameters of link travel time distribution.

The means are estimated directly when given the initials for the set of standard deviation due to the stability of mean link travel time. Table 17 presents the mean link travel time estimates. The unit for the estimates is second.

Table 17. Mean Estimation Results (Second)

	E.M.		E.M.		E.M.
Link1	231.69	Link10	121.66	Link19	123.77
Link2	111.94	Link11	303.29	Link20	119.44
Link3	168.27	Link12	169.36	Link21	121.74
Link4	184.09	Link13	185.69	Link22	124.62
Link5	364.24	Link14	60.20	Link23	276.61
Link6	246.32	Link15	59.93	Link24	57.31
Link7	245.57	Link16	180.39	Link25	126.20
Link8	122.77	Link17	312.01	Link26	228.28
Link9	236.55	Link18	233.90	Link27	312.48

Because there is no real values of standard deviation collected for the sake of comparison, BIC, as a criterion for model selection, is introduced as an indicator to decide the optimal results of standard deviation.

$$BIC = -2 \times \ln \hat{L} + k \times \ln(n) \quad [16]$$

where

k is the number of free parameters to be estimated;

n is the number of data points;

\hat{L} is the maximized value of the likelihood function of the model.

BIC is calculated by first changing the parameter λ from 0.1 to 0.5 with 0.1 increment. After the process is done, we choose the minimal BIC and continue to check the results by changing λ with 0.001 increment. Table 18 shows the results of BIC with different values of λ . When λ is 0.004, the estimation results are found to be optimal as shown in Table 19.

Table 18. λ and BIC

λ	BIC		λ	BIC
0.1	128959.09		0.401	128835.11
0.2	129157.44		0.402	128851.29
0.3	129303.12		0.403	128807.15
0.4	128849.01		0.404	128876.19
0.5	129206.13		0.405	128824.45
			0.406	128848.85
			0.407	128996.08
			0.408	129086.55
			0.409	128848.55
		

Table 19. Standard Deviation Estimation Results (Second)

	E.S.D.		E.S.D.		E.S.D.
Link1	35.93	Link10	31.61	Link19	27.74
Link2	24.74	Link11	20.80	Link20	2.19
Link3	19.57	Link12	47.80	Link21	31.32
Link4	29.01	Link13	32.18	Link22	4.09
Link5	55.94	Link14	6.37	Link23	51.87
Link6	37.92	Link15	14.90	Link24	5.62
Link7	36.54	Link16	20.06	Link25	20.18
Link8	17.87	Link17	29.15	Link26	32.28
Link9	31.61	Link18	45.12	Link27	46.86

The estimation results are close to the real situation except for four links, Link 14, Link 20, Link 22 and Link 24, whose estimates are small. It is possible that the four links are minor roads or there is relatively small change in traffic conditions. Taking the mean estimation into account, the means on Link 14 and Link 24 are less than 60 seconds. Thus, a small standard deviation is fine on any of the links.

In the real network estimation, the value of λ is often determined by experience.

4.5 Effect of Sample Size on Estimation

It is supposed that the sample size will have influence on the accuracy of the estimation. The simplified Sioux Falls network continues to be used as a case in this section. The trip itineraries information is that used in Section 4.4.2.

One of the assumptions in the methodology is that it is necessary to make sure the trip-link matrix is full rank. That means that the least number of the observed trips should be equal to the number of links, which is 27. Thus, one trip data is reduced at one time till there are 27 trips left. The sample size effect is tested on the accuracy of mean travel time estimation and travel time standard deviation estimation.

4.5.1 Effect of Mean Estimation

Because the mean travel time for each link is relatively stable in the previous tests, the mean estimation remains stable when decreasing the number of observed trips. In other words, the mean estimations are the same regardless of the quantity of the observed trips when the trip-link matrix is kept at full rank.

The mean link travel time estimation in the scenario with 27 trips observed are in Table 20. They are the same as the scenario with 45 trips observed.

Table 20. Mean Estimation Results of 27 trips observed

	E.M.		E.M.		E.M.
Link1	41.51	Link10	36.17	Link19	43.54
Link2	46.88	Link11	36.39	Link20	56.97
Link3	45.20	Link12	43.85	Link21	31.93

Table 20. Continued

	E.M.		E.M.		E.M.
Link4	47.60	Link13	39.57	Link22	40.01
Link5	30.18	Link14	31.10	Link23	48.25
Link6	32.11	Link15	52.62	Link24	43.89
Link7	52.42	Link16	40.83	Link25	48.32
Link8	38.65	Link17	57.15	Link26	35.95
Link9	32.74	Link18	58.17	Link27	42.88

4.5.2 Effect of Standard Deviation Estimation

A significant change of standard deviation estimations is expected when reducing the sample size. The standard deviation estimation results in the scenario with 27 trips observed are shown in Table 21. The results are slightly different compared with the results in the scenario with 45 trips observed.

Table 21. Standard Deviation Estimation Results of 27 trips observed

	E.S.D.		E.S.D.		E.S.D.
Link1	7.15	Link10	5.35	Link19	10.20
Link2	2.91	Link11	2.10	Link20	1.15
Link3	6.78	Link12	2.14	Link21	1.92
Link4	6.68	Link13	7.11	Link22	6.42
Link5	5.12	Link14	2.00	Link23	8.42
Link6	4.26	Link15	2.93	Link24	4.21
Link7	7.13	Link16	7.49	Link25	6.79
Link8	5.89	Link17	4.98	Link26	3.15
Link9	3.66	Link18	9.30	Link27	2.50

The comparison of RMSE and MAPE are shown in Table 22, Figure 8 and Figure 9. In general, when reducing the number of observed trips, the RMSE of the basic model increases. But in terms of Revised-Lasso penalized model, the RMSE shows a fluctuating trend when reducing the number of observed trips. As a whole, the RMSE of Revised-Lasso penalized model is kept lower than that of the basic model when changing sample size. When reducing the number of observed trips, there is a more significant effect on the estimation performance of the basic model than shown in Revised-Lasso penalized model.

Table 22. RMSE and MAPE of Basic Model and Revised-Lasso Penalized Model by Reducing the Number of Observed Trips

	B-RMSE	RL-RMSE	B-MAPE	RL-MAPE
45 Trips	1.20	0.96	33.34%	26.77%
44 Trips	1.27	1.04	35.42%	27.28%
43 Trips	1.22	1.04	32.68%	27.27%
42 Trips	1.19	1.03	32.28%	27.02%
41 Trips	1.28	1.11	29.54%	26.90%
40 Trips	1.23	1.11	29.10%	25.75%
39 Trips	1.33	1.05	41.15%	29.04%
38 Trips	1.36	1.05	42.79%	28.96%
37 Trips	1.31	1.05	39.48%	28.18%
36 Trips	1.32	1.06	39.22%	28.21%
35 Trips	1.32	1.04	39.64%	27.76%
34 Trips	1.21	0.88	38.35%	26.14%
33 Trips	1.24	0.94	39.54%	27.32%
32 Trips	1.25	0.96	39.81%	27.80%
31 Trips	1.41	1.00	43.29%	29.24%
30 Trips	1.35	0.97	35.47%	24.54%
29 Trips	1.44	0.95	37.09%	23.64%
28 Trips	1.46	0.95	40.58%	24.60%
27 Trips	1.83	1.04	47.70%	27.09%

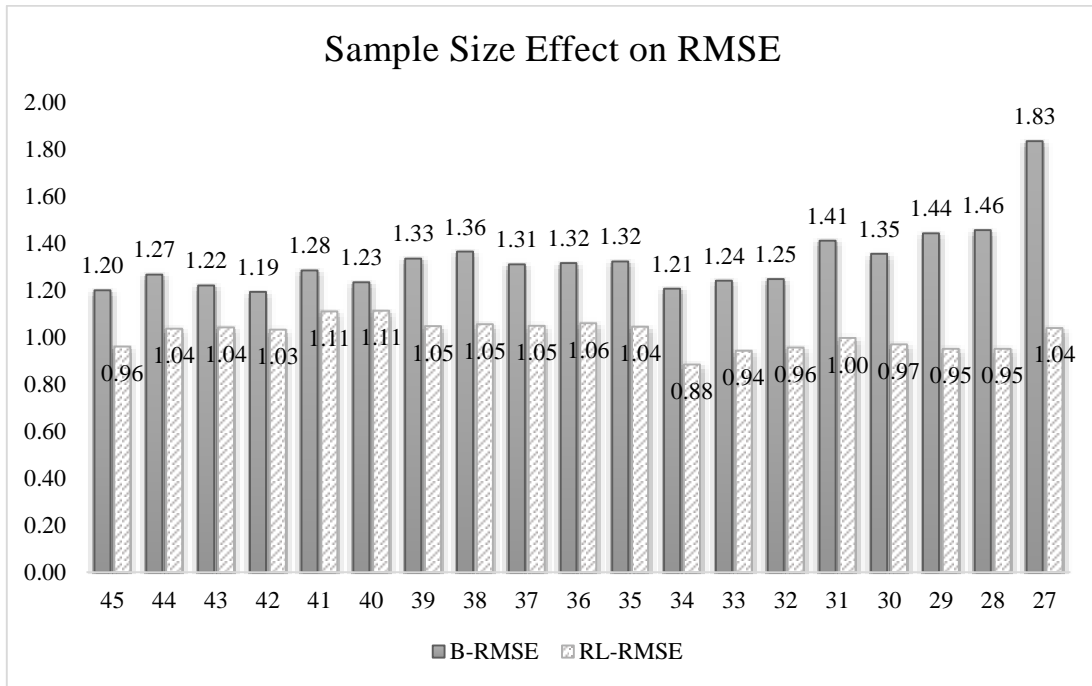


Figure 8. Sample Size Effect on RMSE

The MAPE results show an ascending trend of the basic model. But with Revised-Lasso penalized model, the MAPEs have smaller values and do not change too much when reducing the sample size. The effect of sample size on the estimates of the basic model is more significant. The MAPE of Revised-Lasso penalized model keeps stable.

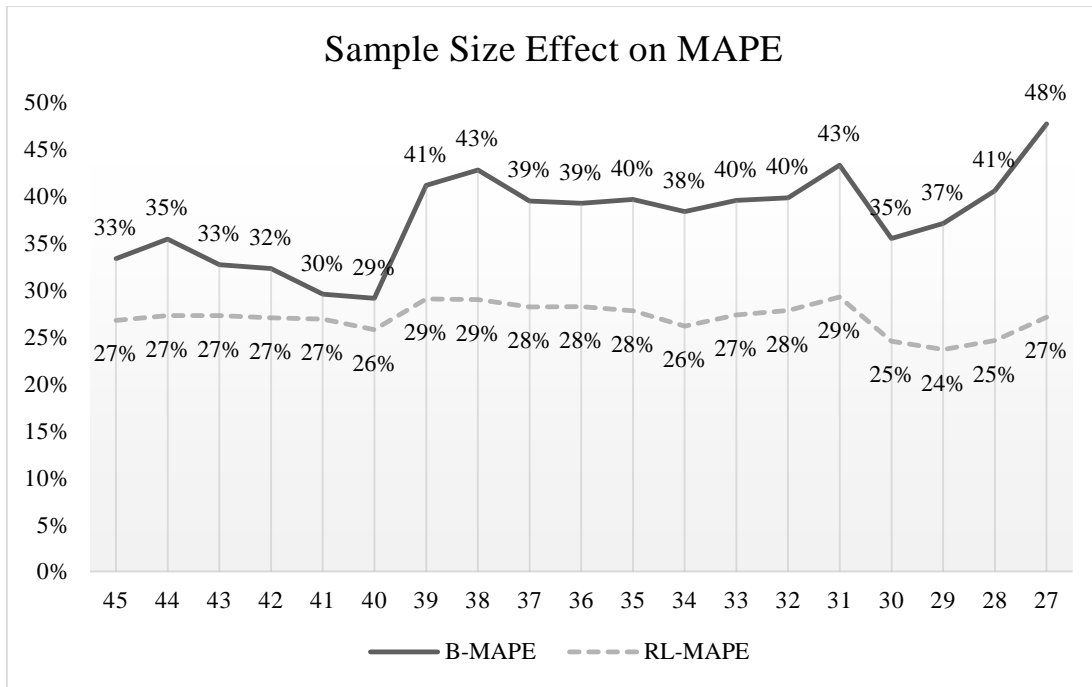


Figure 9. Sample Size Effect on MAPE

In summary, reducing sample size has small influences on mean estimation. But for the standard deviation, sample size has much more influence on the basic model than Revised-Lasso penalized model due to the comparison of the changing rates on the two indicators of RMSE and MAPE. Revised-Lasso penalized model is better to use in the link travel time estimation because the estimation results are more accurate and stable with different sample sizes.

CHAPTER V

APPLICATION

In the previous chapters, the penalized models can estimate the link travel time efficiently and accurately, especially Revised-Lasso penalized model. In this chapter, an application is described to estimate link parameters in a different problem where we take advantage of the maximum likelihood method and the penalty method. We introduce the application problem first and then describe the estimation model and process in detail. The estimation results are provided at the end.

5.1 Application Problem Description

From the perspective of general awareness, time is equal to distance divided by speed. Similarly, travel time is assumed to depend on length and speed. Thus, there is a hypothetical relationship given in equation [17]:

$$t = \theta \times \frac{L}{V} + e \quad [17]$$

where

t is the link travel time;

L is the link length;

V is the free flow speed;

e is an error.

When trips are observed with known route and trip itineraries are recorded, the parameter θ can be estimated taking advantage of the proposed methods. It helps reveal the relationship among link length, speed and link travel time.

5.2 Model Application

To simplify the problem, the factors such as traffic flow, traffic signals and pedestrians, etc., are not considered. Link length, speed and travel time are the three major factors in this case.

5.2.1 Simulation Network and Assumptions

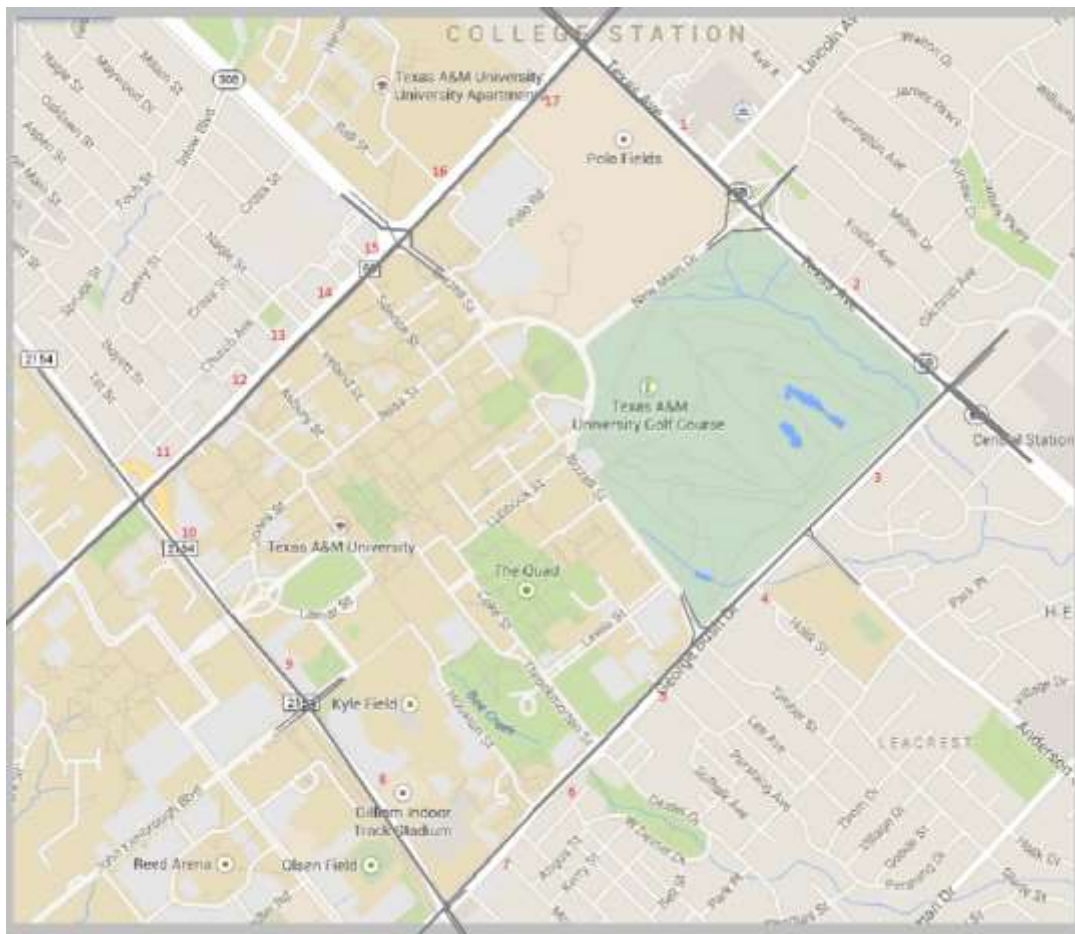


Figure 10. Simulation of Selected Network in College Station

Figure 10 displays the simulated network in this application. 17 links are selected in the network, which are shown as grey lines. The length and speed are assigned for each link based on the real network configuration. Only the traffic going clockwise is observed. Similar to the assumptions proposed, link travel times are independent of each other. Each link travel time is also assumed to follow a normal distribution. 15 trips with known route are observed and 39 travel times for each trip are recorded. The travel time data is simulated in Vissim. The trip itinerary data is in APPENDIX H.

5.2.2 Estimation Model

For link a_n , the travel time t_{a_n} is a response variable and L_{a_n}, V_{a_n} are known parameters. The error terms e_{a_n} are independently and normally distributed with mean 0 and variance σ^2 . Therefore, the regression model has a probability density function:

$$f(t_{a_n} | \theta_{a_n}, \sigma^2) = \frac{1}{\sqrt{2\pi\sigma^2}} e^{-\frac{(t_{a_n} - \theta_{a_n} \times \frac{L_{a_n}}{V_{a_n}})^2}{2\sigma^2}} \quad [18]$$

Trip travel times follow normal distribution, since the links are independent and follow normal distribution. The maximum likelihood method is considered to estimate θ and σ^2 . The penalty method is applied to prevent model over-fitting when estimating. Equation [19] is the general form of minimizing the penalized log-likelihood function.

$$\text{Minimize } M(X | \beta) = \sum_i L(\beta_i) + \sum_i P_\lambda(\beta_i) \quad [19]$$

Different from the link travel time estimation, θ and σ^2 are estimated by optimizing the penalized models because the trip-link matrix is not full rank. Two kinds of penalized forms are used according to the features of the two parameters. Lasso

penalty is used to estimate θ (see equation [20]), and Revised-Lasso penalty is used to estimate σ^2 (see equation [21]).

$$\text{Minimize } L_1(T|\alpha) = \sum_i^m (\log(\sum_{a_n}^n \delta_{i,a_n} \sigma_{a_n}^2) + \frac{1}{\sum_{a_n}^n \delta_{i,a_n} \sigma_{a_n}^2} \left(t_i - \sum_{a_n}^n \delta_{i,a_n} \times \left(\frac{L_{a_n}}{V_{a_n}} \times \theta_{a_n} \right) \right)^2) + \lambda_1 \sum_i^m \left| \sum_{a_n}^n \delta_{i,a_n} \theta_{a_n} \right| \quad [20]$$

$$\text{Minimize } L_2(T|\alpha) = \sum_i^m (\log(\sum_{a_n}^n \delta_{i,a_n} \sigma_{a_n}^2) + \frac{1}{\sum_{a_n}^n \delta_{i,a_n} \sigma_{a_n}^2} \left(t_i - \sum_{a_n}^n \delta_{i,a_n} \times \left(\frac{L_{a_n}}{V_{a_n}} \times \theta_{a_n} \right) \right)^2) + \lambda_2 \sum_i^m \left| \sum_{a_n}^n \delta_{i,a_n} \frac{1}{\sigma_{a_n}^2} \right| \quad [21]$$

where

n is the number of links, which is 17;

m is the number of trip, which is 15.

δ_{i,a_n} is a binary variable. When the link is taken, the value of δ_{i,a_n} is 1;

otherwise, the value is 0. θ and σ^2 are positive, which are treated as constraints. In order to make sure θ is not close to zero, the lower bound of every θ is 0.1.

5.2.3 Estimation Procedure

The first step is to solve θ by optimizing L_1 when the initial values of σ^2 are given 1. The optimal θ_j is obtained. And then apply the optimal θ_j to L_2 . σ_j^2 is

calculated by optimizing L_2 . Put the σ_j^2 back to L_1 , and the optimal θ_{j+1} is calculated.

Then put the θ_{j+1} to L_2 , and σ_{j+1}^2 is calculated. We repeat the iterations until $\varepsilon \leq 5\%$,

($\varepsilon = \frac{\theta_{j+1} - \theta_j}{\theta_j}$ or $\varepsilon = \frac{\sigma_{j+1}^2 - \sigma_j^2}{\sigma_j^2}$) and end the calculation. In the application, λ_1 is chosen

as 0.0001 and λ_2 is chosen as 0.001.

5.3 Application Results Analysis

After running several iterations following the procedure above, the estimation results of the parameter θ and standard deviation are given in Table 23.

Table 23. Estimation Results in the Application

	θ	E.S.D.		θ	E.S.D.
Link1	1.09	10.35	Link10	1.45	0.23
Link2	0.99	1.81	Link11	0.20	5.48
Link3	0.93	0.83	Link12	2.01	0.27
Link4	1.02	0.32	Link13	2.43	0.33
Link5	1.00	0.23	Link14	1.38	0.77
Link6	0.10	1.98	Link15	0.10	0.27
Link7	0.68	0.61	Link16	0.10	0.34
Link8	0.57	0.61	Link17	1.53	0.73
Link9	2.07	0.73			

CHAPTER VI

CONCLUSIONS AND DISCUSSIONS

This study proposes an algorithm to estimate the parameters of link travel time distributions based on the trip itinerary data in a given network. Compared with the basic model proposed in previous research, the three advanced models with penalty can give more accurate estimates through testing three simulated networks (i.e., 10-link network, 20-link network and 50-link network). RMSE and MAPE serve as accuracy measures for estimation performance. Among the penalized models, revised-Lasso penalized model is the best model in estimating link travel time standard deviation regardless of network sizes. The effect of sample size on the basic model and the Revised-Lasso penalized model is conducted. The results show that there is a significantly negative effect on the basic model estimation by cutting the sample size down. In contrast, sample size has only a little effect on Revised-Lasso penalized model. Moreover, Revised-Lasso penalized model is applied to a simplified Sioux Falls network. The mean and standard deviation of link travel time are well estimated. It gives a detailed description of estimation procedure without comparing with true values.

Furthermore, the concepts of maximum likelihood method and the penalty to regularize estimation model are applied to estimate parameters in a different problem, which assumes that link travel time depends on the link length and free flow speed with an undetermined parameter. Taking advantage of the proposed method, the parameter for each link is estimated based on the trip itinerary data using Lasso penalized function and

Revised-Lasso penalized function. In terms of the application, the trip-link matrix is not full rank, so the estimation results are obtained by iterations.

The maximum likelihood method with penalty is biased when estimating the parameters. When the variables follow independent and identical normal distributions, the estimate of mean is unbiased only using maximum likelihood function, but variance is biased. But when the quantity of sample size approaches unlimited amount, I believe the estimate of variance become unbiased. In the transportation problem, data is provided with a large quantity, thus both the estimates of mean and variance can be considered as unbiased. In this study, the basic model only using the maximum likelihood function shows a poor prediction on variance. This is because of many degrees of freedom in the variables. The basic model is unbiased, but the estimation results are far from the real values. In contrast, despite that the penalized maximum likelihood function is biased, the estimation results are better and more realistic in the numerical tests.

This study presents a method to estimate parameters of link travel time distribution that appears to be more efficiently and accurately and introduced the concept of penalty to the estimation model. However, there are some limitations to the proposed method.

1. In the problem assumptions, all link travel time distributions are assumed to be independent. However, in the real networks, link travel times are correlated because of traffic going through multiple links on one trip. Link travel times are highly dependent on each other.

2. The tuning parameter λ is pre-decided before optimizing the penalized model. Exhaustive methods are used to decide λ , but the value of λ remains subjective and is selected by experience, which adds practical difficulty for application.

Whether these limitations warrant different methods or a similar method along this line is yet to be examined, but is worth careful consideration. Last but may not the least, it merits careful examination of the biasedness of the maximum likelihood estimation method. There may be other errors in this thesis that the author has not been aware of.

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APPENDIX A

10-LINK NETWORK TRIP ITINERARY DATA

Trip#	TT1	TT2	TT3	TT4	TT5	TT6	TT7	TT8	TT9	TT10	TT11	TT12
1	142.38	152.41	176.51	175.63	164.32	163.07	178.67	185.51	163.76	172.45	152.97	161.74
2	261.28	258.61	286.63	274.95	269.93	260.21	278.31	278.06	290.21	291.80	283.23	277.40
3	76.83	77.33	78.08	78.68	70.31	72.12	74.16	80.14	75.41	76.68	76.05	71.01
4	163.87	140.18	166.35	181.14	148.68	146.78	166.11	171.34	181.51	163.55	175.02	180.06
5	70.83	82.42	95.20	95.82	78.44	90.56	94.30	105.54	75.31	86.89	76.48	87.00
6	175.81	165.10	180.04	190.58	171.14	159.07	177.33	185.16	183.05	177.27	189.18	188.32
7	220.41	243.44	259.02	255.48	250.08	242.56	255.47	267.48	234.07	255.73	235.04	239.02
8	45.43	44.39	41.72	40.27	44.98	37.94	41.02	43.70	39.72	41.66	44.97	45.38
9	301.33	275.85	339.73	338.92	301.57	289.58	328.51	316.22	339.80	330.28	331.48	336.39
10	380.26	366.99	414.81	414.00	387.76	371.78	405.67	403.50	423.02	415.54	415.69	414.23
	TT13	TT14	TT15	TT16	TT17	TT18	TT19	TT20	TT21	TT22	TT23	TT24
1	143.41	120.90	158.26	153.46	158.33	157.35	177.45	146.49	161.13	159.88	132.60	160.96
2	274.90	256.88	279.86	259.82	314.08	280.19	284.63	289.86	265.52	284.72	274.54	279.93
3	71.26	71.92	73.14	70.85	75.74	76.22	73.80	74.72	74.00	75.67	69.14	76.35
4	137.68	136.06	148.04	153.27	144.34	161.46	183.82	138.72	151.91	176.75	146.07	174.62
5	65.39	62.81	78.14	70.19	73.67	76.76	86.43	73.75	95.79	84.30	73.07	93.15
6	140.48	159.34	164.96	155.71	154.68	171.71	189.44	153.19	176.46	178.05	156.28	195.46
7	216.54	213.86	243.29	221.67	237.91	236.42	249.32	230.68	252.33	228.86	214.34	251.34
8	43.50	41.30	42.49	39.34	47.88	41.37	40.66	44.10	41.55	44.19	40.38	45.85
9	285.93	295.32	313.57	288.74	327.36	317.43	336.34	297.47	306.79	319.95	315.81	329.56
10	365.76	368.64	391.05	368.48	410.77	400.05	425.11	385.68	391.79	406.71	385.70	418.65
	TT25	TT26	TT27	TT28	TT29	TT30	TT31	TT32	TT33	TT34	TT35	TT36
1	160.58	147.81	151.39	141.62	156.99	154.39	160.03	154.96	170.07	162.94	148.38	150.10
2	290.73	264.06	285.17	257.82	277.17	276.03	265.64	280.44	290.29	272.87	265.57	264.07
3	77.77	69.99	75.45	72.07	71.18	74.95	71.75	72.20	64.60	78.03	78.19	69.11
4	165.52	153.94	147.88	157.44	147.51	164.42	162.37	143.62	195.90	166.31	168.25	151.76
5	81.72	77.04	78.67	74.44	87.39	85.93	82.01	79.16	87.91	90.44	80.35	73.63
6	184.73	161.23	161.51	167.35	156.91	177.02	164.66	155.21	194.23	182.72	186.97	159.73
7	247.66	224.39	237.42	217.63	236.33	236.63	233.75	234.97	234.62	246.49	236.57	226.38
8	43.82	42.55	40.90	35.69	38.06	43.49	39.47	35.34	43.87	40.52	45.24	44.54
9	338.31	296.75	316.42	305.56	313.09	313.75	302.12	302.58	354.23	315.00	308.71	298.13
10	418.73	375.51	397.08	378.66	386.91	398.27	384.33	388.40	435.14	404.17	392.47	372.39
	TT37	TT38	TT39	TT40	TT41	TT42	TT43	TT44	TT45	TT46	TT47	TT48
1	171.62	146.66	148.94	138.09	166.98	154.40	142.69	158.43	132.17	156.56	159.05	154.02
2	303.62	274.63	254.91	260.26	289.35	279.53	285.13	272.02	256.16	269.58	264.59	272.30
3	83.84	74.47	76.42	74.92	76.88	71.71	77.39	77.30	70.45	76.12	75.70	72.59
4	171.48	149.15	169.74	166.92	177.93	150.61	153.32	140.64	157.52	146.82	144.16	147.27
5	82.68	78.22	85.48	84.60	78.09	70.34	70.00	92.32	75.01	79.53	84.59	75.19
6	188.56	157.78	179.89	182.02	181.47	153.53	178.34	162.70	177.49	163.36	164.24	161.14
7	256.78	226.19	227.68	223.06	239.31	228.63	232.33	250.06	220.96	240.83	245.41	237.25
8	41.43	40.19	39.44	45.02	42.39	45.71	43.50	45.90	43.65	44.11	44.98	33.45
9	332.92	306.94	307.94	317.52	330.11	297.02	317.83	291.42	309.16	294.70	285.80	304.37
10	434.18	385.56	384.58	388.02	416.56	380.79	405.93	375.52	383.31	377.05	373.09	391.45
	TT49	TT50	TT51	TT52	TT53	TT54	TT55	TT56	TT57	TT58	TT59	TT60
1	154.05	163.88	151.01	125.67	147.67	161.07	150.47	165.03	157.22	172.40	161.99	171.59
2	264.96	276.79	302.88	272.36	244.90	270.67	281.14	265.72	274.13	291.74	274.40	292.00
3	65.63	75.13	76.61	77.14	74.05	75.27	69.87	73.97	71.21	76.34	70.20	80.79
4	154.80	161.40	142.30	126.22	147.26	172.29	152.30	159.26	173.97	175.83	166.27	170.13
5	63.28	83.78	74.47	61.52	75.67	88.77	77.66	80.49	82.78	96.77	84.60	86.99
6	148.01	171.83	152.18	146.76	154.33	179.05	165.21	172.50	185.92	186.73	179.33	187.91
7	211.56	243.91	229.74	210.54	222.82	236.67	230.16	245.50	239.21	252.13	242.79	258.28
8	40.68	40.90	38.41	41.73	40.09	45.79	40.53	36.85	47.03	41.04	37.96	37.55
9	291.53	309.02	320.08	277.37	270.12	309.23	317.81	305.67	324.76	328.33	336.38	333.62
10	369.00	396.01	403.47	362.62	348.77	391.73	397.98	394.22	406.00	421.38	410.18	425.41
	TT61	TT62	TT63	TT64	TT65	TT66	TT67	TT68	TT69	TT70	TT71	TT72
1	155.88	180.33	163.83	152.04	140.07	167.54	141.62	153.50	158.49	154.14	142.66	148.43
2	286.01	314.66	276.30	272.59	259.35	287.45	254.84	288.53	271.04	266.24	279.67	246.49
3	79.33	76.74	72.53	73.78	69.38	72.62	65.91	80.57	71.05	74.65	76.37	72.98

4	137.43	165.26	151.07	159.73	135.75	180.50	151.26	148.73	138.12	153.43	153.30	151.73
5	75.70	83.72	89.13	78.55	79.55	81.41	78.84	74.74	87.39	83.35	69.95	78.43
6	155.81	167.20	161.57	165.84	150.58	185.85	160.59	166.66	154.74	167.00	173.04	168.23
7	243.72	255.21	242.95	227.74	223.43	240.11	221.61	241.86	246.38	237.83	232.72	229.55
8	41.55	43.53	37.95	41.65	42.98	47.73	40.41	40.27	41.71	48.52	40.48	39.93
9	293.34	340.08	304.32	311.65	295.25	332.52	303.25	309.74	299.08	300.50	312.60	284.38
10	385.78	427.09	389.13	391.05	362.54	414.52	371.67	397.93	379.28	376.95	400.27	366.67
	TT73	TT74	TT75	TT76	TT77	TT78	TT79	TT80	TT81	TT82	TT83	TT84
1	141.08	150.26	168.95	151.04	138.94	155.96	130.96	134.44	159.23	177.35	146.22	159.30
2	245.23	278.45	294.45	269.61	250.21	277.19	270.67	262.68	299.90	295.53	273.99	268.11
3	75.40	79.25	74.72	77.25	75.64	76.78	76.96	73.68	72.86	74.83	71.60	73.64
4	158.96	142.44	174.69	168.19	165.65	162.39	155.21	170.96	157.32	181.29	142.63	172.81
5	81.21	69.87	89.46	88.09	81.34	90.91	64.68	73.36	75.82	91.78	68.59	92.56
6	174.85	159.11	180.85	191.15	188.52	185.15	174.78	183.28	170.87	174.19	153.34	179.78
7	222.13	235.83	240.62	244.42	230.98	249.85	215.58	214.80	241.90	238.17	225.10	239.57
8	42.44	42.79	44.91	42.41	45.36	41.86	43.95	44.04	41.74	46.67	45.12	40.21
9	285.48	290.25	333.51	331.09	305.38	319.82	305.98	308.82	334.54	330.84	294.40	324.76
10	364.16	380.18	414.53	405.39	384.39	405.43	388.34	390.60	420.67	411.94	373.20	402.25
	TT85	TT86	TT87	TT88	TT89	TT90	TT91	TT92	TT93	TT94	TT95	TT96
1	128.37	166.63	175.89	140.81	164.33	161.24	175.12	173.94	166.66	144.79	169.21	162.24
2	262.36	280.68	283.41	256.61	260.43	281.38	282.44	296.30	270.75	274.02	314.18	273.78
3	78.32	70.71	70.35	71.67	71.53	71.19	67.57	77.45	72.32	76.04	74.62	76.10
4	154.43	168.07	157.80	130.98	153.88	164.37	167.61	156.53	159.30	171.13	181.04	175.40
5	76.68	89.15	84.58	78.27	87.81	69.94	91.38	80.78	90.36	84.67	81.58	87.13
6	174.69	176.03	167.60	152.36	168.22	158.76	172.99	165.09	166.82	196.03	185.69	183.31
7	215.31	237.78	254.79	227.94	246.92	225.67	248.91	250.47	243.82	236.58	241.15	242.63
8	45.17	44.50	38.87	45.59	37.70	41.68	40.39	41.84	40.43	40.26	44.70	42.26
9	296.22	322.13	323.31	276.00	306.03	319.64	328.39	320.34	304.39	328.63	368.06	324.80
10	376.56	401.50	405.10	353.88	381.67	394.17	408.06	405.00	387.35	412.44	446.74	406.54
	TT97	TT98	TT99	TT100	TT101	TT102	TT103	TT104	TT105	TT106	TT107	TT108
1	135.11	155.24	138.88	162.08	163.17	165.03	171.10	130.73	125.27	159.19	183.90	153.94
2	253.61	275.66	272.03	259.25	276.74	296.35	282.75	253.41	259.59	276.02	286.08	282.70
3	69.82	72.81	78.94	69.45	74.26	79.27	72.72	77.77	68.81	75.98	74.10	77.18
4	142.18	157.12	147.14	156.27	170.74	152.76	173.16	136.25	139.85	154.29	177.51	146.55
5	68.59	83.59	72.45	83.34	89.65	84.09	78.79	73.29	70.22	87.12	93.58	86.72
6	158.30	173.97	167.15	170.68	183.07	163.11	181.62	163.00	148.26	178.93	177.06	164.71
7	217.93	241.12	228.47	244.07	242.76	242.31	244.33	225.70	203.87	256.99	250.40	243.97
8	44.13	44.31	45.72	40.29	40.05	43.04	43.00	46.66	43.36	42.56	42.46	38.98
9	284.52	314.01	299.99	306.98	328.66	321.96	320.66	280.69	292.08	314.30	330.97	311.17
10	362.38	395.04	380.25	384.55	409.28	403.15	408.51	357.63	362.26	401.75	413.58	395.50
	TT109	TT110	TT111	TT112	TT113	TT114	TT115	TT116	TT117	TT118	TT119	TT120
1	149.67	157.85	163.28	166.53	156.04	161.75	150.35	133.27	182.91	141.13	152.40	173.46
2	291.87	285.51	266.40	282.97	273.31	260.73	288.95	254.62	272.71	263.53	262.58	266.26
3	74.63	72.24	71.80	71.05	69.20	73.21	81.13	75.15	73.42	71.56	72.57	72.01
4	179.62	178.97	172.96	173.23	160.13	175.94	138.22	147.66	172.71	155.38	169.53	168.05
5	84.29	87.57	76.01	86.97	77.62	89.69	75.62	72.84	95.59	72.28	80.23	86.07
6	187.76	187.91	177.02	176.45	172.92	187.55	155.96	171.69	174.34	170.49	177.28	175.41
7	230.04	234.85	231.90	239.91	235.19	241.65	233.47	222.41	250.28	220.57	226.40	247.63
8	41.65	44.04	43.49	41.10	47.30	36.44	39.80	42.23	45.58	43.92	40.05	43.68
9	349.46	336.29	304.58	338.43	312.86	320.71	308.36	291.82	314.82	303.69	308.29	301.08
10	429.78	420.22	391.74	414.26	394.29	402.65	388.80	372.91	393.02	379.78	388.63	383.58
	TT121	TT122	TT123	TT124	TT125	TT126	TT127	TT128	TT129	TT130	TT131	TT132
1	162.47	155.29	169.08	150.45	145.35	139.31	157.16	145.75	135.84	167.27	152.51	160.70
2	268.93	267.64	304.53	299.54	262.29	238.34	292.31	246.35	268.31	297.52	274.55	292.47
3	69.30	73.30	78.42	72.57	69.66	75.31	82.46	70.25	75.02	75.46	74.98	78.22
4	176.19	161.96	159.06	143.96	136.15	131.86	171.07	152.45	143.50	158.26	133.15	177.28
5	83.51	80.58	82.95	61.38	73.24	79.74	73.52	82.48	65.86	76.46	75.82	87.55
6	181.53	171.83	166.87	148.16	149.27	150.03	172.32	164.26	162.58	174.24	147.42	191.47
7	240.83	232.21	247.60	222.68	223.01	226.40	229.05	222.20	222.02	250.56	234.43	242.67
8	42.61	35.19	39.99	42.05	42.18	37.22	42.78	40.40	36.87	41.77	40.41	40.83
9	323.94	318.49	329.83	320.53	282.60	259.49	327.87	290.90	295.59	331.63	280.52	346.73
10	404.88	394.92	417.11	394.69	363.15	341.49	410.36	364.27	383.66	419.34	369.37	429.35
	TT133	TT134	TT135	TT136	TT137	TT138	TT139	TT140	TT141	TT142	TT143	TT144
1	177.47	156.15	160.41	161.00	180.71	156.37	153.23	148.82	168.74	172.05	171.03	156.63
2	287.44	281.11	285.87	271.99	291.49	271.08	274.94	260.07	293.87	284.11	289.37	285.32

3	69.30	70.05	73.52	71.57	73.78	77.78	74.50	79.44	74.69	76.68	74.12	68.17
4	149.07	164.92	170.92	145.50	164.66	160.20	151.91	162.66	163.80	180.77	167.76	151.05
5	84.77	83.86	82.08	72.59	84.65	83.03	87.14	81.63	93.70	93.01	89.67	73.89
6	159.68	172.18	183.77	151.82	165.53	179.80	162.30	175.07	174.98	194.73	175.24	154.54
7	252.86	231.38	240.03	233.77	250.11	243.40	231.28	232.19	248.34	252.77	246.25	227.70
8	43.79	42.92	42.31	41.95	36.05	46.40	40.94	44.14	44.29	43.67	43.70	41.47
9	315.81	328.06	332.15	287.42	318.47	312.57	310.07	295.09	330.86	330.12	330.69	317.84
10	396.30	404.52	416.27	371.40	410.20	395.17	389.00	375.97	412.11	419.02	409.81	393.99
	TT145	TT146	TT147	TT148	TT149	TT150						
1	142.94	124.77	153.94	169.50	131.23	152.86						
2	284.37	262.92	287.60	309.16	247.29	289.61						
3	73.12	74.43	80.64	74.95	68.98	75.69						
4	159.34	131.74	158.29	155.43	145.92	154.79						
5	86.71	68.57	84.48	83.06	78.89	75.70						
6	177.20	152.46	176.83	158.64	154.83	167.82						
7	230.15	212.66	240.56	241.71	209.50	234.81						
8	46.65	36.29	41.10	44.01	42.74	46.57						
9	336.86	297.33	321.28	325.65	284.36	315.78						
10	404.75	369.81	409.61	413.96	356.17	399.90						

APPENDIX B

20-LINK NETWORK TRIP ROUTE DATA

Link#	1	2	3	4	5	6	7	8	9	10
Trip1	0	0	0	0	0	0	0	1	0	0
Trip2	0	0	0	0	0	0	0	0	0	0
Trip3	1	0	0	0	1	1	0	0	0	1
Trip4	0	1	1	1	1	0	0	1	1	1
Trip5	1	0	0	0	0	0	1	1	0	0
Trip6	0	1	1	0	0	1	1	0	1	1
Trip7	0	0	0	0	0	0	0	0	0	1
Trip8	1	1	1	1	1	1	1	1	1	1
Trip9	1	1	1	0	0	0	1	0	1	1
Trip10	1	1	1	1	1	1	1	1	1	1
Trip11	1	1	0	1	0	1	1	1	0	1
Trip12	0	0	1	1	1	1	1	0	1	0
Trip13	0	0	1	1	1	1	1	1	1	1
Trip14	0	0	0	0	0	0	1	1	0	0
Trip15	1	0	0	0	0	1	0	0	0	0
Trip16	1	1	1	1	1	0	1	1	0	1
Trip17	1	1	1	0	1	1	1	1	1	1
Trip18	1	0	1	1	1	1	1	1	1	1
Trip19	1	1	1	1	1	1	1	1	1	1
Trip20	0	0	0	1	1	0	1	0	1	0
Link#	11	12	13	14	15	16	17	18	19	20
Trip1	0	0	0	0	0	1	0	0	0	1
Trip2	0	0	0	0	0	0	1	0	0	0
Trip3	0	0	0	0	0	0	0	1	1	0
Trip4	1	0	1	1	1	0	1	1	1	1
Trip5	0	1	0	1	0	0	0	0	0	0
Trip6	0	1	1	0	0	1	0	1	1	1
Trip7	0	0	0	0	0	0	0	0	0	0
Trip8	1	1	1	1	1	1	1	1	1	1
Trip9	0	1	0	0	1	1	0	0	0	0
Trip10	1	1	1	1	1	1	1	1	0	1
Trip11	1	1	0	1	0	1	1	1	1	1
Trip12	0	1	0	1	1	0	0	1	1	1
Trip13	1	1	0	1	1	1	1	1	1	1
Trip14	1	0	0	1	0	1	0	1	0	0
Trip15	1	0	1	0	1	0	0	1	0	0
Trip16	1	1	1	1	1	0	1	1	1	1
Trip17	0	0	1	1	1	1	0	1	1	1
Trip18	1	1	1	1	1	0	1	1	0	1
Trip19	1	1	1	1	0	1	1	1	1	1
Trip20	1	0	1	1	0	1	1	1	0	1

APPENDIX C

20-LINK NETWORK TRIP ITINERARY DATA

Trip#	TT1	TT2	TT3	TT4	TT5	TT6	TT7	TT8	TT9	TT10
1	159.84	148.81	138.53	127.92	160.91	160.57	161.15	138.74	141.91	134.40
2	40.34	41.62	35.05	33.11	40.22	50.72	42.08	35.68	30.40	39.00
3	271.26	302.48	302.52	286.33	256.39	298.00	334.06	317.73	282.70	334.62
4	736.49	739.84	688.70	759.91	692.22	738.88	762.02	722.01	715.51	759.71
5	207.18	232.02	205.16	212.57	242.22	243.70	287.09	241.08	218.10	287.80
6	561.32	529.93	548.46	574.52	554.87	597.80	590.41	555.06	565.26	564.37
7	45.46	45.38	48.69	47.24	47.64	46.44	44.91	46.18	46.65	41.81
8	941.32	953.79	907.58	964.47	918.61	997.29	1030.79	961.67	922.76	1028.35
9	408.39	391.27	415.57	418.94	414.41	440.12	461.98	443.89	401.37	464.01
10	889.45	901.85	850.01	913.01	882.46	948.21	977.61	903.91	862.48	982.00
11	680.49	713.96	674.87	673.63	691.67	742.33	750.73	689.34	663.65	758.50
12	567.96	566.68	546.94	585.42	527.17	580.56	570.14	544.96	561.81	606.19
13	815.01	796.45	777.98	806.93	773.76	838.75	826.09	776.86	785.15	836.38
14	284.57	278.74	270.75	262.18	296.29	305.51	322.20	274.04	273.99	317.48
15	273.89	320.23	285.60	315.03	286.93	311.02	354.55	336.93	276.15	341.71
16	783.72	832.55	736.36	813.07	780.63	829.11	868.97	814.79	780.22	874.14
17	773.47	783.50	758.86	787.60	750.00	812.28	878.37	809.78	759.33	855.48
18	786.94	822.21	761.43	831.54	793.16	847.05	882.20	817.35	779.33	878.20
19	888.02	897.63	865.01	907.56	876.87	954.74	985.82	908.25	880.18	977.34
20	519.64	515.68	483.18	520.23	503.16	570.76	567.45	509.45	515.22	567.62
	TT11	TT12	TT13	TT14	TT15	TT16	TT17	TT18	TT19	TT20
1	147.11	133.92	151.69	154.65	133.39	153.35	143.05	128.08	129.74	159.81
2	31.13	36.91	41.23	42.39	39.71	46.02	49.81	19.82	20.77	27.62
3	305.83	296.79	301.72	288.18	282.75	307.38	328.00	305.73	309.64	268.97
4	735.07	754.05	723.27	766.51	748.27	753.71	766.50	692.77	673.54	736.38
5	229.64	256.97	249.24	229.06	239.59	256.37	249.62	243.50	249.62	226.62
6	579.19	590.98	546.69	571.32	572.83	579.92	558.05	557.31	575.24	553.97
7	46.54	48.78	45.67	50.72	47.68	44.74	45.54	45.17	46.72	48.26
8	973.99	993.89	961.49	968.45	966.87	995.22	1004.81	935.98	934.35	940.78
9	442.14	438.48	429.93	415.46	416.45	443.76	415.08	405.29	442.45	411.03
10	917.43	940.46	910.74	916.30	915.04	942.37	951.38	888.01	888.62	882.99
11	708.50	724.50	713.36	697.88	706.81	747.25	730.13	685.70	677.83	701.10
12	571.82	596.55	564.05	566.94	569.86	586.30	575.20	565.12	571.97	568.79
13	802.52	827.26	814.53	814.64	800.99	831.36	829.35	764.29	782.25	806.57
14	283.52	302.61	318.06	280.55	284.61	294.98	298.79	280.20	276.31	309.35
15	313.87	318.76	306.86	293.48	332.51	323.42	350.23	334.70	322.15	281.60
16	822.42	845.67	815.84	825.20	832.60	847.71	858.50	795.65	786.72	791.94
17	807.58	814.03	797.28	787.68	783.08	807.20	823.83	777.98	770.52	787.02
18	813.41	849.13	814.46	835.47	839.73	854.44	868.11	809.93	810.34	782.29
19	922.52	943.96	909.16	926.48	911.82	945.53	951.43	892.88	885.03	886.52
20	534.02	554.10	534.33	543.80	525.00	536.40	548.96	518.35	481.45	520.12
	TT21	TT22	TT23	TT24	TT25	TT26	TT27	TT28	TT29	TT30
1	146.12	139.89	116.37	150.20	138.70	153.01	127.12	116.90	155.52	155.20
2	19.02	32.14	32.31	37.00	37.29	29.51	28.49	41.35	31.94	24.03
3	286.96	318.74	287.20	322.10	313.10	278.31	289.80	257.97	275.84	273.25
4	744.45	751.65	688.63	733.47	719.41	752.43	707.95	694.54	730.79	719.20
5	248.33	236.00	234.98	245.09	247.26	255.61	242.80	216.51	244.02	244.37
6	568.67	595.21	563.11	582.03	564.20	595.70	544.01	554.98	564.88	591.74
7	45.12	47.38	51.27	48.79	48.48	43.56	44.40	46.73	45.70	41.12
8	957.61	982.09	921.48	981.33	959.14	985.85	939.27	904.43	956.14	956.42
9	429.38	441.10	417.59	408.57	420.55	438.01	411.56	419.42	451.13	414.06
10	906.93	921.60	875.03	932.89	898.61	925.41	893.44	851.19	896.10	896.42
11	677.72	704.01	678.47	727.87	721.25	724.30	686.27	662.03	705.36	701.92
12	577.03	576.12	529.09	564.29	574.53	589.79	576.73	531.43	571.87	567.14
13	784.54	795.90	751.33	802.62	805.60	819.60	787.58	756.10	806.21	798.23
14	278.14	278.45	284.95	291.23	286.88	298.06	291.26	268.83	292.52	300.94
15	320.37	333.59	316.89	342.90	314.89	312.44	316.90	286.92	307.59	314.34
16	817.72	841.96	772.92	831.13	820.42	839.10	796.83	759.46	806.34	802.04
17	808.77	823.25	761.24	820.19	787.63	804.89	777.00	727.54	793.39	788.04

18	826.68	833.24	792.34	845.48	815.18	828.61	816.18	765.12	808.78	800.17
19	902.52	933.60	883.61	938.91	908.83	932.09	887.49	859.11	893.68	906.98
20	515.05	542.30	510.12	525.86	503.84	531.97	521.75	497.97	507.80	509.78
	TT31	TT32	TT33	TT34	TT35	TT36	TT37	TT38	TT39	TT40
1	138.50	148.58	147.59	155.75	141.87	146.25	155.18	120.93	141.12	138.79
2	35.08	36.63	31.71	40.31	36.81	33.30	34.65	38.67	31.47	26.56
3	252.52	284.62	260.90	318.09	280.46	267.33	315.74	287.80	313.08	272.25
4	738.95	762.55	714.67	770.88	729.46	738.50	761.93	707.48	751.60	680.36
5	241.27	226.92	187.91	242.95	244.09	233.53	233.38	207.94	227.77	200.75
6	561.11	627.06	604.57	611.03	591.00	560.10	585.73	584.82	609.31	539.93
7	41.46	49.08	43.73	52.24	39.33	47.35	46.00	43.73	47.21	43.62
8	944.92	997.25	914.48	1019.77	979.07	955.22	994.54	933.28	986.00	879.93
9	420.51	446.06	368.43	470.96	446.06	435.38	426.25	395.17	430.03	410.03
10	900.63	935.54	858.51	966.40	928.42	909.01	941.97	882.82	920.13	826.79
11	674.66	725.43	663.70	748.94	713.99	682.00	713.27	668.75	711.53	623.55
12	566.64	590.45	562.64	612.46	572.93	567.99	577.89	555.67	601.11	512.49
13	791.65	831.15	773.29	851.71	806.74	803.17	812.48	780.19	820.03	730.43
14	289.64	301.44	263.58	287.86	297.08	303.19	276.33	280.95	275.96	261.17
15	303.29	312.52	303.53	322.66	337.05	301.56	334.73	314.62	337.91	292.08
16	808.47	822.88	760.90	850.82	808.65	808.27	838.64	769.39	840.08	744.73
17	771.76	825.91	752.37	845.56	798.73	792.61	824.97	765.47	815.93	742.23
18	821.40	828.78	779.13	866.83	828.43	810.02	856.38	793.52	832.48	740.94
19	890.73	950.74	872.17	966.66	923.84	895.28	948.72	894.05	927.29	829.35
20	516.94	565.56	521.22	562.82	532.75	542.30	548.23	524.38	528.74	465.69
	TT41	TT42	TT43	TT44	TT45	TT46	TT47	TT48	TT49	TT50
1	162.85	135.53	127.48	160.23	157.01	141.88	146.71	149.79	131.24	122.51
2	33.76	36.03	39.08	34.76	31.34	39.77	34.09	41.46	34.28	34.95
3	285.04	290.78	285.19	319.96	294.90	285.69	306.72	298.70	286.43	265.41
4	746.39	749.62	764.49	802.67	770.75	735.42	741.73	754.73	766.54	726.57
5	256.72	272.35	195.42	250.65	230.25	245.18	238.59	240.94	232.29	226.00
6	587.33	583.47	591.99	634.30	664.85	578.80	571.50	577.81	607.42	554.95
7	48.58	46.20	41.08	38.73	45.15	49.44	46.54	46.16	48.06	41.82
8	979.20	994.52	963.81	1049.44	1030.56	968.43	973.54	981.91	991.99	942.03
9	423.62	439.92	404.25	441.61	479.16	434.94	436.24	427.06	453.58	423.08
10	928.24	942.61	915.48	985.01	974.74	915.98	914.80	930.11	940.58	893.37
11	741.21	738.26	651.16	752.41	721.34	719.50	704.97	706.69	705.08	676.35
12	574.41	595.42	555.82	651.00	614.41	554.08	556.45	572.49	622.72	544.53
13	817.07	825.45	774.76	875.61	849.84	795.51	799.76	808.81	842.11	767.61
14	316.46	319.23	268.00	308.17	303.00	295.25	294.96	278.67	291.42	276.68
15	311.08	311.44	331.71	340.49	343.60	325.23	325.24	318.18	310.87	320.72
16	831.39	851.79	800.65	896.64	837.43	826.70	820.69	828.04	818.15	807.69
17	808.50	814.28	808.89	871.92	861.61	791.96	810.32	805.80	823.16	748.07
18	836.13	846.79	821.84	892.22	866.86	823.54	819.10	847.47	850.48	804.56
19	936.96	948.88	919.66	993.48	978.01	917.98	923.10	937.84	937.04	890.95
20	546.95	560.96	565.82	598.22	595.47	523.61	528.34	555.39	559.51	525.32
	TT51	TT52	TT53	TT54	TT55	TT56	TT57	TT58	TT59	TT60
1	139.82	170.06	136.44	130.03	142.59	136.75	147.36	156.44	160.03	138.98
2	34.27	27.63	27.58	27.31	49.28	33.40	42.52	37.79	49.87	42.42
3	289.15	264.56	284.93	296.65	281.40	285.90	298.62	283.20	291.34	282.87
4	707.59	717.98	714.14	670.73	746.31	730.45	760.52	728.87	767.20	750.25
5	216.20	234.03	250.75	265.07	248.28	216.57	226.33	262.68	230.56	262.06
6	555.09	590.76	568.16	539.99	544.81	568.73	592.78	563.38	589.88	544.86
7	50.28	43.32	46.11	44.91	46.45	40.17	50.57	47.64	52.03	50.25
8	927.29	932.09	937.05	920.90	958.89	951.48	990.42	975.61	989.61	969.73
9	411.49	412.85	410.38	426.37	412.84	436.69	455.96	452.05	426.76	419.71
10	878.98	870.46	880.43	868.37	896.67	899.34	936.68	932.13	934.76	926.42
11	659.12	699.81	685.19	698.07	717.10	664.23	707.96	730.06	719.29	710.09
12	544.20	567.72	549.88	541.25	573.47	564.54	601.04	557.12	577.02	579.72
13	780.47	794.90	767.36	765.02	825.68	785.47	844.32	806.82	845.63	816.23
14	274.17	294.06	280.20	305.44	307.93	274.14	280.03	306.11	295.14	300.08
15	287.79	285.97	315.15	310.63	285.13	322.64	319.08	312.08	291.29	297.77
16	784.90	781.58	819.46	772.65	813.00	795.68	828.77	825.64	830.86	839.88
17	765.96	787.93	773.85	769.07	785.66	789.66	810.74	800.98	798.41	791.83
18	784.49	784.01	802.36	781.77	810.37	807.96	848.22	830.30	841.96	847.63
19	879.86	884.20	888.66	877.22	905.44	894.13	926.58	923.59	945.55	919.53
20	507.29	492.88	488.47	483.39	520.38	530.84	534.64	524.33	555.12	543.07

	TT61	TT62	TT63	TT64	TT65	TT66	TT67	TT68	TT69	TT70
1	129.55	152.21	148.06	129.21	157.47	145.45	148.05	144.25	167.89	163.22
2	25.18	32.38	42.13	37.31	53.12	34.62	22.59	38.55	27.71	35.40
3	300.76	288.25	308.23	285.04	289.84	306.45	283.95	310.94	268.46	280.58
4	739.58	754.51	722.48	679.84	766.73	739.79	746.04	763.75	756.50	723.48
5	277.55	235.30	255.09	227.08	246.66	247.05	224.25	280.07	240.23	246.27
6	573.78	575.73	548.43	533.44	568.15	595.63	567.90	596.87	600.92	577.07
7	46.03	43.18	40.78	46.05	46.66	49.14	43.15	48.38	46.21	43.68
8	983.22	972.89	961.39	898.56	999.35	973.80	951.90	1028.73	992.98	969.56
9	433.84	429.23	426.59	407.60	434.61	425.72	412.29	487.71	436.19	437.47
10	937.15	915.19	907.28	851.80	949.74	920.26	898.58	987.00	948.22	928.19
11	720.18	702.55	706.75	652.74	742.93	707.99	660.45	751.56	732.18	707.96
12	609.45	576.09	558.53	527.90	604.74	590.33	576.66	609.03	594.73	552.29
13	822.77	803.86	798.40	751.04	869.14	826.12	800.13	845.84	829.19	797.59
14	301.65	295.79	297.29	271.79	325.42	302.67	288.06	313.86	302.02	298.49
15	313.39	311.45	307.60	289.36	273.78	302.72	306.76	337.61	320.75	323.96
16	840.51	818.05	813.62	764.65	854.57	815.55	797.14	856.90	833.39	811.52
17	797.35	810.40	799.81	745.82	805.78	810.73	796.27	859.23	816.77	797.59
18	860.67	826.37	815.90	769.47	844.95	831.02	811.97	888.67	848.00	828.44
19	940.26	927.57	916.34	854.56	948.08	931.49	898.90	974.96	937.76	920.68
20	541.17	566.59	524.58	487.52	581.86	536.40	531.72	570.69	552.20	537.96
	TT71	TT72	TT73	TT74	TT75	TT76	TT77	TT78	TT79	TT80
1	132.19	126.74	159.01	127.15	163.63	144.04	144.65	141.86	125.30	154.67
2	43.62	37.47	37.40	33.42	33.83	34.18	12.61	38.15	42.92	24.62
3	287.42	284.61	293.67	281.75	249.40	303.18	293.44	276.54	305.36	308.00
4	724.18	750.66	736.42	706.83	771.36	708.07	736.76	749.65	717.55	749.14
5	237.28	258.60	221.87	214.44	226.37	222.94	237.96	227.92	257.00	228.34
6	575.61	571.83	560.40	549.16	585.19	570.21	600.73	537.49	557.16	582.00
7	48.32	46.80	45.29	51.63	47.83	45.67	46.83	46.26	46.52	47.36
8	957.63	984.81	952.81	912.66	972.09	930.18	965.37	943.11	956.97	973.12
9	419.24	448.73	405.60	399.52	439.49	403.94	435.01	401.90	419.45	421.89
10	906.06	943.14	896.60	866.69	926.73	867.44	900.39	896.02	905.19	909.34
11	697.10	693.97	698.74	669.49	684.52	686.36	689.21	659.24	705.58	709.46
12	560.92	585.30	557.97	544.13	587.90	540.98	572.91	543.30	555.94	587.72
13	795.67	807.81	807.97	774.15	826.87	770.18	791.04	776.27	785.61	817.44
14	297.55	282.73	304.58	283.70	304.68	266.04	300.88	288.94	293.52	296.40
15	326.99	340.36	300.23	299.30	294.85	296.49	313.77	328.44	331.59	306.51
16	816.21	830.94	799.96	772.63	805.56	772.25	808.41	823.60	804.16	815.18
17	791.36	812.11	793.02	747.52	817.65	777.40	817.66	789.69	798.37	817.65
18	823.92	867.03	800.13	782.08	829.07	779.79	798.38	816.67	826.77	815.61
19	904.91	925.00	903.49	864.73	912.45	896.24	919.11	879.53	910.80	927.48
20	537.82	536.15	531.87	490.06	562.97	489.31	530.74	526.31	518.21	539.79
	TT81	TT82	TT83	TT84	TT85	TT86	TT87	TT88	TT89	TT90
1	135.95	157.23	152.31	158.86	123.77	145.44	142.07	131.90	132.75	129.03
2	22.82	39.97	22.94	21.56	41.31	29.77	44.96	24.66	30.09	36.93
3	290.79	319.97	273.96	284.98	290.03	276.65	300.35	269.79	274.13	276.29
4	676.31	745.03	711.93	723.64	720.47	736.54	782.02	710.86	703.80	720.90
5	208.80	255.87	241.23	249.49	250.97	227.46	255.50	211.98	206.98	253.69
6	545.67	575.43	571.89	549.48	557.34	588.06	604.58	561.90	554.89	549.59
7	44.19	43.61	47.08	51.66	45.08	42.96	45.28	44.55	45.02	47.43
8	892.13	996.62	935.76	932.40	961.94	960.44	1021.62	922.62	909.87	937.32
9	387.53	448.76	408.06	418.41	421.56	431.01	448.67	401.17	412.61	413.26
10	843.37	934.31	878.84	880.07	912.06	898.28	965.36	874.42	855.51	890.59
11	641.63	726.96	696.99	678.32	718.20	692.46	732.74	657.46	652.29	687.14
12	515.17	581.92	558.27	549.46	572.15	551.20	615.86	546.18	556.38	540.13
13	727.08	828.59	785.01	782.86	794.36	786.63	856.31	759.11	769.09	774.59
14	267.57	295.78	293.21	301.83	296.13	302.06	297.27	273.23	257.31	301.73
15	315.56	319.49	277.91	292.39	329.46	315.25	327.58	310.55	285.99	305.33
16	761.36	849.43	796.48	803.17	822.01	791.24	862.56	776.85	779.45	796.56
17	755.17	827.54	766.44	781.92	783.68	808.43	826.08	764.24	739.38	770.82
18	764.95	840.83	785.73	803.19	826.28	788.91	882.25	782.01	770.68	806.40
19	850.49	942.86	899.42	888.20	909.54	911.45	968.88	872.86	856.78	896.05
20	481.41	532.21	517.46	517.62	534.60	532.45	575.46	510.00	493.84	516.25
	TT91	TT92	TT93	TT94	TT95	TT96	TT97	TT98	TT99	TT100
1	149.60	159.85	135.86	131.73	143.74	165.35	128.21	160.05	142.85	141.64
2	39.39	38.74	36.53	33.16	30.37	38.84	31.91	38.37	43.70	17.01

3	320.41	327.50	285.73	271.74	284.60	268.75	307.10	247.77	274.59	276.25
4	751.10	721.39	746.12	727.14	739.98	758.70	741.54	707.02	676.33	682.58
5	246.14	250.36	234.16	232.56	231.01	231.74	215.90	204.47	229.82	222.74
6	577.30	601.84	560.28	563.27	586.41	611.34	576.79	567.61	503.32	581.68
7	45.61	44.22	44.67	42.03	43.42	41.76	44.45	42.74	43.88	45.10
8	990.31	994.09	956.31	937.74	965.97	987.15	959.32	920.68	884.57	906.72
9	434.25	450.98	419.53	417.67	424.19	420.16	414.85	413.02	385.28	409.71
10	937.41	932.89	901.12	890.30	911.88	939.33	895.21	879.44	836.52	850.09
11	714.22	732.62	675.59	671.63	694.05	711.12	685.22	666.12	682.50	668.17
12	596.27	562.97	569.38	539.85	577.96	602.22	597.15	544.75	492.69	551.26
13	832.19	810.64	800.06	756.49	795.41	839.78	811.70	783.51	735.75	758.37
14	288.47	281.87	284.15	286.99	273.79	298.00	265.39	282.02	266.79	279.22
15	316.53	335.46	303.24	315.90	322.26	297.87	310.98	295.70	283.68	286.55
16	828.53	826.24	817.44	815.34	828.19	828.13	799.79	763.52	765.60	754.59
17	827.73	817.65	785.13	775.73	788.86	804.33	787.34	755.56	699.62	761.08
18	850.77	837.19	814.19	798.71	824.63	844.17	817.35	785.18	754.91	759.30
19	940.00	954.49	902.61	890.60	913.04	941.37	908.35	865.36	847.45	868.92
20	543.07	530.77	525.71	528.87	529.34	572.65	524.06	516.63	453.92	488.44
	TT101	TT102	TT103	TT104	TT105	TT106	TT107	TT108	TT109	TT110
1	133.64	143.93	153.40	123.42	145.58	144.51	151.64	143.68	153.83	164.65
2	49.44	29.94	45.53	47.41	23.25	36.42	62.73	33.28	38.89	37.65
3	259.15	279.14	289.42	279.12	281.41	295.59	307.01	280.77	281.83	259.05
4	689.06	742.22	750.13	705.34	718.39	752.49	759.13	736.37	738.93	754.09
5	247.16	228.72	240.11	225.45	227.75	255.26	243.84	229.80	203.82	240.89
6	536.00	579.16	598.68	545.19	575.83	563.67	577.66	555.69	567.16	548.95
7	42.40	45.94	47.02	43.11	49.34	41.24	44.82	41.55	44.97	42.03
8	910.98	964.20	990.00	919.06	952.76	984.01	1001.06	946.72	936.96	958.77
9	409.47	424.02	450.54	393.22	450.99	422.44	426.64	388.46	385.08	402.54
10	863.90	912.09	934.07	859.51	906.33	933.03	951.89	895.41	882.74	910.48
11	688.80	692.05	721.70	672.17	700.34	721.55	735.18	682.06	678.69	699.53
12	534.25	576.50	551.00	541.08	555.36	588.30	534.03	554.07	563.57	557.15
13	766.98	801.29	809.85	772.71	782.73	813.84	803.89	781.83	805.19	806.60
14	278.15	294.79	293.05	276.42	281.02	304.66	299.68	297.71	302.16	309.59
15	274.72	315.30	324.04	297.68	323.40	318.07	335.71	317.06	280.41	305.90
16	785.81	822.37	844.70	793.39	808.33	849.23	851.23	801.01	783.98	818.06
17	723.85	796.89	807.95	734.63	781.94	808.41	818.01	784.15	779.08	791.00
18	788.18	819.29	831.13	783.36	805.19	840.54	849.78	811.17	787.83	822.41
19	872.98	910.11	938.57	874.27	894.77	934.19	961.58	903.84	896.27	904.04
20	496.40	549.75	529.50	508.78	498.23	557.91	571.49	549.92	549.88	532.14
	TT111	TT112	TT113	TT114	TT115	TT116	TT117	TT118	TT119	TT120
1	130.55	141.57	164.80	145.61	137.49	142.49	144.78	149.40	135.04	136.95
2	45.14	43.72	27.43	31.49	37.75	34.53	55.28	38.51	38.50	28.30
3	317.95	281.94	299.54	269.93	302.63	258.80	309.42	271.25	322.30	280.29
4	718.22	722.18	771.78	706.92	728.25	748.08	755.84	700.31	712.42	685.34
5	228.89	226.19	300.19	207.23	235.26	185.77	244.38	210.29	256.97	262.31
6	556.03	556.81	612.68	575.79	531.21	557.41	597.97	570.88	536.57	551.10
7	44.28	43.78	42.44	39.81	47.70	52.00	52.67	44.52	45.86	44.60
8	959.37	935.34	1035.82	929.62	944.01	920.54	1003.78	925.42	955.87	926.52
9	420.92	386.18	456.00	420.25	432.81	388.74	438.97	415.31	424.98	411.40
10	902.57	880.78	986.66	875.97	886.10	862.58	947.77	873.81	907.59	873.17
11	712.41	676.01	765.25	662.86	686.67	660.20	753.20	679.86	693.19	697.75
12	564.46	551.16	621.31	544.60	544.76	547.23	588.96	531.82	517.47	539.47
13	795.34	788.74	856.94	764.23	784.69	772.49	853.09	776.94	754.88	757.89
14	263.63	296.49	330.28	259.09	288.65	256.49	300.65	296.70	279.19	293.14
15	317.11	297.07	328.76	305.06	304.46	281.46	322.06	305.47	348.00	308.05
16	809.65	784.04	885.68	775.19	803.20	795.76	834.24	765.51	826.00	812.07
17	774.62	782.53	853.42	752.71	787.84	749.78	816.08	774.77	802.90	760.11
18	815.42	797.73	896.17	784.65	796.23	775.86	857.54	771.16	816.47	790.39
19	913.98	893.38	990.29	885.64	889.89	868.67	952.96	873.93	906.61	883.21
20	510.48	536.84	571.56	525.96	509.18	520.37	537.19	504.89	491.65	496.25
	TT121	TT122	TT123	TT124	TT125	TT126	TT127	TT128	TT129	TT130
1	151.64	151.28	121.93	117.40	157.22	151.65	137.49	136.45	130.89	150.74
2	24.54	41.35	33.42	40.19	28.35	42.17	20.49	47.53	41.77	35.88
3	289.35	266.87	288.44	254.36	289.80	279.28	269.79	273.80	285.72	324.57
4	709.46	721.51	693.37	669.02	725.31	698.57	669.35	724.80	751.53	763.94
5	243.89	230.85	201.54	217.84	243.81	231.09	235.26	197.56	232.60	234.57

6	544.32	568.23	574.96	535.76	569.27	584.49	534.43	575.95	581.17	611.20
7	46.23	43.24	40.24	45.89	42.32	40.29	53.12	45.30	47.21	49.58
8	942.54	943.14	922.58	873.12	951.81	939.59	884.73	935.35	968.73	1008.64
9	427.82	398.82	392.81	399.17	426.60	429.12	419.06	406.13	420.89	449.51
10	893.33	893.13	865.03	812.44	896.23	875.27	841.90	883.22	916.15	946.96
11	694.28	694.39	657.31	662.81	708.46	704.62	658.33	678.20	701.71	736.39
12	539.70	546.34	547.38	497.52	581.55	564.03	502.82	561.33	579.94	629.89
13	769.36	791.43	756.21	718.38	794.33	794.21	723.51	800.20	805.10	872.74
14	289.38	295.82	260.11	271.48	286.73	284.84	281.17	271.53	275.38	296.74
15	316.62	305.59	323.59	282.94	312.37	301.34	283.06	292.47	316.94	290.85
16	812.10	793.73	772.74	749.62	817.95	798.04	759.57	774.74	827.78	817.08
17	782.62	768.08	760.92	710.11	800.95	774.77	740.64	754.28	781.86	833.76
18	795.42	806.20	782.86	723.91	816.59	784.42	750.48	788.61	834.95	842.70
19	890.29	899.07	880.01	830.56	897.59	884.70	846.28	887.24	918.21	963.31
20	500.11	523.35	514.29	466.00	513.77	501.58	473.36	520.37	540.61	555.43
	TT131	TT132	TT133	TT134	TT135	TT136	TT137	TT138	TT139	TT140
1	139.06	134.37	140.90	147.93	141.82	137.34	154.87	122.55	128.52	144.35
2	25.71	31.82	37.03	44.66	26.73	45.36	57.14	31.04	38.75	29.74
3	262.90	290.68	272.60	287.59	257.67	292.84	320.61	264.12	287.55	266.61
4	708.72	728.15	703.74	718.13	719.42	705.38	792.14	704.93	704.52	697.75
5	213.99	235.47	218.55	231.26	230.00	247.00	263.76	237.01	227.62	208.19
6	565.09	548.76	561.16	578.93	561.97	526.24	582.68	531.79	570.48	568.86
7	40.95	47.24	47.51	46.25	46.47	44.42	48.17	43.45	43.61	48.18
8	916.56	942.96	924.79	948.35	930.15	944.15	1030.22	915.14	947.02	911.41
9	407.64	411.00	418.64	420.47	423.39	412.38	423.44	404.11	434.03	418.86
10	861.55	892.90	869.46	892.49	877.06	904.31	972.08	884.08	894.37	868.72
11	654.94	690.14	671.06	706.95	676.89	702.87	770.96	648.00	696.73	669.30
12	550.17	569.28	510.59	566.86	544.75	553.72	611.58	565.02	555.43	533.93
13	766.25	784.70	753.73	799.17	778.65	788.70	873.63	768.52	785.00	755.83
14	285.39	274.17	285.50	281.97	291.91	294.53	312.31	271.07	282.56	276.00
15	298.39	310.91	316.70	298.05	293.80	322.62	323.60	302.23	321.99	298.82
16	766.16	803.54	783.55	811.59	789.67	808.66	882.57	785.57	798.36	765.89
17	767.81	781.20	766.41	775.35	759.14	769.79	838.53	741.31	767.80	756.64
18	764.42	812.91	774.82	809.21	780.17	819.22	888.33	821.91	796.53	777.67
19	862.99	892.43	876.70	902.69	877.09	890.05	978.41	867.57	892.50	867.85
20	505.31	510.16	505.97	528.71	493.88	521.45	567.99	521.15	509.03	506.29
	TT141	TT142	TT143	TT144	TT145	TT146	TT147	TT148	TT149	TT150
1	146.56	147.57	142.96	155.72	164.14	127.65	144.31	132.81	136.58	147.10
2	21.26	46.76	40.55	30.91	35.91	33.16	23.31	11.94	34.62	31.30
3	291.01	322.48	278.89	273.04	289.59	280.54	256.46	298.08	289.10	266.89
4	770.89	801.67	741.32	712.68	757.11	689.33	720.86	702.84	694.27	736.81
5	232.90	236.15	216.13	226.67	201.72	220.17	210.19	248.63	223.21	257.74
6	598.23	601.76	579.95	566.88	576.36	534.81	575.07	563.73	573.31	590.21
7	51.06	44.84	44.48	47.22	49.22	48.90	46.81	44.10	47.89	45.76
8	982.67	1036.58	957.10	932.08	960.55	900.25	934.62	939.03	936.43	976.74
9	419.85	440.44	402.49	399.99	404.35	402.33	414.47	427.00	443.99	438.27
10	932.81	976.19	908.18	868.57	903.88	849.73	888.04	890.00	882.19	938.96
11	688.53	731.28	672.46	707.98	672.65	663.99	668.23	670.89	687.09	716.66
12	603.90	623.00	563.36	547.31	569.33	558.83	563.47	569.66	534.75	580.40
13	828.89	874.22	796.81	782.32	810.22	775.86	787.94	769.46	773.33	807.28
14	300.79	295.19	275.82	284.64	269.29	278.98	285.80	294.92	282.26	299.79
15	309.33	332.02	323.09	282.84	315.16	283.63	297.33	316.31	316.41	330.09
16	830.22	868.58	807.10	807.98	823.57	753.27	779.55	794.72	775.47	816.95
17	822.99	848.90	781.00	753.58	795.12	741.56	764.48	795.01	772.36	802.06
18	846.99	883.54	832.96	771.55	821.59	775.95	791.87	800.47	781.78	852.50
19	932.81	979.20	909.24	888.14	899.89	852.73	882.97	894.85	885.71	924.94
20	557.72	573.75	550.20	498.99	535.21	503.69	530.15	524.48	495.79	536.99

APPENDIX D

50-LINK NETWORK TRIP ROUTE DATA

Link#	1	2	3	4	5	6	7	8	9	10
Trip1	0	1	1	1	0	0	1	0	1	0
Trip2	0	0	1	0	0	1	1	0	0	0
Trip3	0	1	1	0	1	0	1	0	0	1
Trip4	1	1	1	1	1	1	1	1	1	1
Trip5	1	0	1	0	1	1	1	0	1	0
Trip6	0	0	0	0	0	0	1	1	0	0
Trip7	1	0	0	0	0	0	0	0	0	1
Trip8	1	1	1	1	1	1	1	1	1	1
Trip9	1	1	1	1	0	1	1	1	1	0
Trip10	1	0	0	1	1	1	0	1	0	1
Trip11	0	0	1	1	0	0	0	0	0	0
Trip12	1	0	1	1	0	1	1	1	1	0
Trip13	1	1	1	1	1	0	1	1	1	1
Trip14	0	1	1	1	0	1	0	0	1	1
Trip15	1	1	1	0	0	1	1	1	1	1
Trip16	0	1	0	0	1	1	0	0	0	0
Trip17	1	1	1	1	1	1	1	1	1	0
Trip18	1	0	0	0	1	1	0	0	0	0
Trip19	0	1	0	0	0	0	0	0	0	0
Trip20	0	0	0	0	0	0	1	0	0	0
Trip21	1	1	0	1	1	1	0	1	0	1
Trip22	0	1	0	1	1	0	0	0	1	1
Trip23	1	0	0	0	0	0	0	0	0	0
Trip24	1	1	1	1	1	1	1	1	1	1
Trip25	0	0	0	0	0	0	0	0	0	0
Trip26	0	0	1	0	0	1	0	0	0	1
Trip27	0	0	0	0	1	0	0	0	0	0
Trip28	0	0	0	1	0	0	1	1	1	0
Trip29	1	1	1	1	0	1	1	0	1	1
Trip30	0	1	0	1	0	1	0	0	1	1
Trip31	1	0	0	0	0	0	0	0	0	0
Trip32	1	1	1	1	1	1	1	1	1	1
Trip33	1	0	1	0	0	0	1	0	1	1
Trip34	1	1	1	1	1	1	1	1	1	1
Trip35	0	1	1	1	1	0	1	0	1	1
Trip36	0	0	0	1	0	0	1	0	1	0
Trip37	0	0	1	1	0	1	1	0	1	0
Trip38	0	1	0	0	1	0	0	1	1	0
Trip39	1	0	1	0	0	1	0	0	0	1
Trip40	1	1	1	1	0	1	1	1	1	1
Trip41	0	0	1	0	1	0	1	1	1	1
Trip42	0	0	1	0	0	0	0	1	0	1
Trip43	0	0	1	1	1	1	1	0	0	0
Trip44	1	1	1	1	1	1	1	1	1	1
Trip45	1	0	0	0	1	0	0	0	0	0
Trip46	0	0	1	1	0	0	0	0	0	1
Trip47	0	0	0	0	1	0	1	1	0	0
Trip48	1	1	0	0	1	1	1	1	0	1
Trip49	0	1	1	0	0	1	1	1	1	0
Trip50	0	0	0	0	1	0	1	0	1	0
Link#	11	12	13	14	15	16	17	18	19	20
Trip1	1	0	0	0	1	0	1	0	0	1
Trip2	1	0	0	0	0	1	0	0	0	0
Trip3	1	1	1	0	0	0	1	0	1	1
Trip4	1	1	1	1	1	1	1	1	1	1
Trip5	1	1	0	1	1	1	1	0	1	1
Trip6	1	0	0	0	0	1	1	0	0	0
Trip7	0	0	0	0	0	0	0	1	0	0
Trip8	1	0	0	1	1	1	1	1	1	1

Trip9	0	1	1	0	1	0	1	1	1	0
Trip10	1	1	1	1	1	0	0	1	1	0
Trip11	0	0	0	0	0	0	0	0	0	0
Trip12	1	1	0	1	1	0	0	1	1	0
Trip13	1	1	1	1	1	1	1	1	1	1
Trip14	1	1	1	0	1	1	1	1	1	0
Trip15	1	1	1	1	1	1	1	1	1	0
Trip16	0	0	1	1	0	0	0	1	0	1
Trip17	1	1	1	1	1	1	1	1	1	1
Trip18	0	1	0	1	0	1	0	0	0	0
Trip19	0	0	0	0	0	0	0	0	0	0
Trip20	1	1	0	0	1	0	0	0	1	1
Trip21	1	0	0	1	1	1	0	0	1	0
Trip22	1	1	1	0	1	1	1	0	1	1
Trip23	1	1	0	1	1	0	0	0	0	0
Trip24	1	1	1	1	1	1	1	1	1	1
Trip25	0	0	0	0	0	0	0	0	0	1
Trip26	0	0	0	0	0	0	0	0	0	1
Trip27	1	0	0	0	0	1	0	0	0	0
Trip28	1	0	0	0	0	1	0	1	1	0
Trip29	0	1	1	1	1	0	1	0	1	1
Trip30	1	0	0	1	1	0	1	0	0	0
Trip31	0	0	0	0	0	0	0	0	0	0
Trip32	1	1	1	1	1	0	0	1	1	1
Trip33	0	0	1	1	1	0	1	1	0	0
Trip34	1	1	0	1	1	0	1	1	1	1
Trip35	1	1	1	0	1	1	0	1	0	0
Trip36	0	0	0	0	1	0	0	0	0	0
Trip37	0	1	0	0	0	1	0	1	1	1
Trip38	0	0	0	1	1	1	1	0	0	0
Trip39	0	1	1	0	1	0	1	1	1	1
Trip40	1	1	1	1	1	1	1	1	1	1
Trip41	1	1	0	1	1	1	1	1	1	1
Trip42	1	1	0	1	1	1	1	0	0	0
Trip43	1	1	0	0	0	1	0	1	0	0
Trip44	1	1	1	1	0	1	1	1	1	1
Trip45	0	0	1	0	1	0	0	0	0	0
Trip46	1	0	0	1	0	1	0	1	0	1
Trip47	0	0	0	1	1	1	0	1	0	0
Trip48	1	1	1	1	1	0	1	1	0	1
Trip49	1	1	0	0	1	0	1	1	1	0
Trip50	0	0	0	1	1	1	0	0	0	1
Link#	21	22	23	24	25	26	27	28	29	30
Trip1	0	0	1	1	1	0	0	0	0	1
Trip2	1	0	1	0	0	0	0	1	0	1
Trip3	0	0	1	0	0	1	1	1	1	1
Trip4	1	0	1	1	1	1	1	1	1	1
Trip5	1	1	1	1	1	1	1	1	0	1
Trip6	0	0	0	1	0	1	1	1	0	1
Trip7	0	1	0	1	0	1	1	0	1	0
Trip8	1	1	1	1	1	1	1	1	1	1
Trip9	1	1	1	1	1	1	1	0	1	1
Trip10	0	0	1	0	0	1	0	1	1	1
Trip11	0	0	0	0	0	0	0	0	0	1
Trip12	1	1	1	1	1	1	1	0	0	0
Trip13	0	1	1	1	1	1	1	1	1	1
Trip14	1	1	1	1	1	1	1	1	1	1
Trip15	1	0	1	1	1	0	1	1	1	1
Trip16	0	0	1	0	0	1	1	1	0	0
Trip17	1	1	1	1	1	1	1	0	1	1
Trip18	0	0	1	0	0	0	0	1	0	0
Trip19	0	0	0	0	0	0	0	0	0	0
Trip20	1	1	1	1	1	1	0	0	1	1
Trip21	0	1	1	1	0	1	0	1	1	0
Trip22	0	1	0	1	1	0	1	1	0	0
Trip23	0	0	0	0	0	0	1	0	0	0

Trip24	1	1	1	1	1	1	1	1	1	1
Trip25	1	0	0	0	0	0	0	0	0	0
Trip26	0	0	0	1	0	0	1	0	0	0
Trip27	0	0	0	0	1	0	0	1	0	0
Trip28	0	1	1	1	0	1	1	1	0	0
Trip29	0	0	0	1	0	0	1	0	1	1
Trip30	0	1	0	0	1	1	0	1	1	1
Trip31	0	0	0	0	0	0	0	0	0	0
Trip32	1	1	1	1	0	1	1	0	1	1
Trip33	0	0	0	0	1	0	0	0	0	1
Trip34	1	1	1	1	1	1	1	1	1	1
Trip35	0	1	0	0	0	0	0	1	0	0
Trip36	0	0	0	0	0	0	0	0	0	0
Trip37	0	0	1	0	1	0	0	1	0	0
Trip38	0	1	0	0	0	1	0	1	1	1
Trip39	1	1	1	0	0	1	1	1	0	1
Trip40	1	1	1	1	1	1	1	1	1	1
Trip41	1	1	1	0	1	1	0	0	1	1
Trip42	0	0	1	0	0	1	0	0	0	0
Trip43	0	0	1	0	1	0	0	1	0	0
Trip44	1	1	1	1	1	1	1	1	1	1
Trip45	1	0	0	0	0	0	0	0	0	1
Trip46	1	1	0	0	0	0	1	1	0	0
Trip47	1	0	0	0	0	0	1	1	0	0
Trip48	1	1	1	1	1	1	1	1	1	1
Trip49	1	0	1	0	1	1	0	0	0	1
Trip50	1	0	1	1	0	0	1	0	1	0
Link#	31	32	33	34	35	36	37	38	39	40
Trip1	1	1	1	1	1	1	0	0	0	0
Trip2	0	1	0	1	0	1	0	0	0	0
Trip3	1	0	1	1	1	1	1	0	1	0
Trip4	1	1	1	1	1	1	1	1	1	1
Trip5	1	1	0	1	1	0	1	1	1	1
Trip6	0	0	0	0	0	0	0	0	0	1
Trip7	0	0	0	1	0	0	0	0	0	1
Trip8	1	1	1	1	1	1	0	1	1	1
Trip9	1	0	1	1	1	1	1	0	0	0
Trip10	1	1	1	0	1	1	0	0	1	1
Trip11	0	1	0	0	0	0	0	0	0	0
Trip12	1	0	0	0	1	0	0	0	1	1
Trip13	1	0	1	1	1	1	1	1	1	1
Trip14	1	0	1	1	1	1	1	1	1	1
Trip15	1	0	1	1	1	1	1	1	0	1
Trip16	1	0	1	0	0	0	0	1	1	0
Trip17	1	1	1	1	1	1	1	1	1	1
Trip18	1	1	1	0	1	0	1	1	0	1
Trip19	0	0	0	0	0	0	0	0	0	0
Trip20	0	0	0	0	0	0	0	1	1	1
Trip21	1	1	0	0	1	1	0	1	1	1
Trip22	1	0	1	1	1	0	0	0	1	0
Trip23	1	0	0	0	0	0	0	0	0	0
Trip24	1	1	1	1	1	1	1	1	1	1
Trip25	0	0	0	0	0	0	0	0	0	0
Trip26	0	0	0	1	0	0	1	0	0	1
Trip27	0	0	0	0	1	0	1	0	0	0
Trip28	1	1	0	0	0	0	1	0	0	1
Trip29	1	0	1	1	1	1	1	1	0	1
Trip30	0	1	0	0	0	0	0	1	0	0
Trip31	0	0	0	0	0	0	0	0	1	0
Trip32	1	1	1	1	0	1	1	1	1	1
Trip33	1	0	1	0	1	1	1	0	0	0
Trip34	1	1	1	1	1	1	1	1	1	1
Trip35	0	1	1	1	0	1	1	0	0	0
Trip36	0	0	0	0	1	0	0	0	0	1
Trip37	0	1	0	1	0	1	1	1	0	1
Trip38	1	0	1	0	1	1	0	0	0	1

Trip39	1	0	1	1	0	0	0	1	1	0
Trip40	1	1	1	1	1	0	1	1	0	1
Trip41	1	1	0	0	1	1	1	0	1	1
Trip42	0	0	0	1	0	0	0	1	1	1
Trip43	0	0	0	1	0	0	0	1	0	1
Trip44	1	1	1	0	1	0	1	1	1	1
Trip45	1	0	0	0	0	0	0	1	0	0
Trip46	0	0	0	0	0	0	0	0	0	0
Trip47	1	0	0	0	0	0	0	0	1	1
Trip48	1	1	1	1	1	1	1	1	1	1
Trip49	0	1	1	1	1	0	1	1	1	0
Trip50	1	1	0	0	0	0	0	0	0	0
Link#	41	42	43	44	45	46	47	48	49	50
Trip1	0	0	1	0	0	1	1	0	1	0
Trip2	0	1	0	1	0	0	1	0	0	0
Trip3	1	0	1	1	1	1	1	1	1	0
Trip4	1	1	1	1	1	1	1	1	0	1
Trip5	0	1	1	1	1	0	0	1	1	1
Trip6	0	0	1	0	1	1	0	0	1	0
Trip7	0	0	1	0	0	0	0	0	0	0
Trip8	1	1	0	1	0	1	1	1	1	1
Trip9	0	1	1	1	0	1	1	0	1	1
Trip10	1	0	0	1	1	0	0	1	1	1
Trip11	0	0	0	0	0	0	0	0	0	0
Trip12	1	1	1	0	1	1	1	1	0	0
Trip13	1	1	0	1	1	1	1	1	1	1
Trip14	1	1	1	0	1	1	0	1	1	1
Trip15	0	1	0	0	1	0	1	0	1	1
Trip16	0	0	1	0	0	0	0	0	0	1
Trip17	0	1	1	1	1	0	1	1	1	1
Trip18	0	0	1	0	0	0	0	1	0	0
Trip19	0	0	0	0	0	0	0	0	0	0
Trip20	0	1	0	0	0	1	0	0	0	1
Trip21	1	1	0	0	0	0	0	1	1	0
Trip22	0	0	1	1	1	0	0	0	1	0
Trip23	0	0	0	0	1	0	0	0	0	0
Trip24	1	1	1	1	1	1	1	1	0	1
Trip25	0	0	0	0	0	1	0	0	1	0
Trip26	0	1	0	1	0	1	0	0	0	0
Trip27	0	0	0	0	1	0	1	1	0	0
Trip28	0	1	0	1	0	0	1	0	0	1
Trip29	0	1	1	1	0	0	1	1	1	0
Trip30	1	0	1	1	0	1	1	1	1	0
Trip31	0	1	0	0	0	0	0	0	0	1
Trip32	1	1	1	1	1	0	1	1	1	1
Trip33	1	0	0	1	1	0	0	1	0	0
Trip34	1	1	1	1	1	1	1	1	1	1
Trip35	0	0	1	1	1	0	1	0	1	0
Trip36	0	0	0	0	0	0	0	0	1	0
Trip37	1	1	1	0	0	1	1	1	1	0
Trip38	0	1	1	0	1	1	0	1	1	1
Trip39	1	1	0	1	1	1	1	0	1	1
Trip40	1	1	1	1	1	1	1	1	0	1
Trip41	1	1	0	1	1	1	0	1	0	0
Trip42	0	0	1	1	0	0	0	1	1	0
Trip43	1	0	0	0	0	0	1	0	1	0
Trip44	1	1	1	1	1	1	1	1	1	1
Trip45	1	1	0	0	0	0	0	0	0	1
Trip46	0	0	0	1	1	0	1	0	1	0
Trip47	0	0	1	1	1	0	0	1	1	1
Trip48	1	1	1	1	1	1	1	1	1	1
Trip49	0	0	1	1	0	1	0	0	1	0
Trip50	0	0	0	0	1	1	1	1	0	0

APPENDIX E

50-LINK NETWORK TRIP ITINERARY DATA

Trip#	TT1	TT2	TT3	TT4	TT5	TT6	TT7	TT8	TT9	TT10
1	1005.47	1014.23	1055.24	1053.67	1077.96	1078.37	1048.43	991.70	961.61	1019.21
2	693.03	721.72	704.38	707.17	732.84	735.35	756.96	696.96	671.19	709.67
3	1442.46	1474.94	1465.64	1480.40	1525.97	1526.43	1521.93	1432.21	1437.51	1443.65
4	2160.13	2199.57	2168.45	2203.63	2216.72	2253.05	2307.95	2144.13	2105.90	2209.46
5	1741.84	1777.75	1776.92	1731.67	1777.33	1841.56	1851.27	1746.38	1697.79	1785.21
6	669.28	668.18	722.65	696.14	745.17	769.84	751.57	644.15	644.48	668.79
7	504.04	520.87	568.31	529.86	553.77	559.51	554.77	542.86	482.02	536.90
8	2049.68	2071.59	2091.33	2053.18	2082.28	2108.98	2154.82	2039.73	1999.09	2085.88
9	1609.46	1645.54	1654.00	1725.31	1708.54	1708.53	1734.97	1660.93	1577.10	1674.45
10	1354.14	1442.05	1408.10	1418.31	1390.80	1440.09	1489.80	1381.39	1391.40	1452.63
11	143.66	182.47	168.63	191.62	163.24	178.06	176.40	149.92	154.23	178.65
12	1410.70	1436.38	1479.26	1466.83	1455.03	1498.51	1520.57	1420.17	1394.61	1471.18
13	2099.81	2120.05	2116.90	2127.36	2161.11	2184.04	2234.26	2098.53	2074.29	2145.13
14	1822.05	1802.90	1849.12	1872.33	1876.18	1893.00	1873.51	1789.10	1775.44	1788.80
15	1711.31	1738.51	1734.50	1744.33	1787.00	1796.07	1862.71	1743.42	1687.39	1771.80
16	826.10	828.68	775.47	790.37	811.28	829.44	838.50	794.65	786.06	836.87
17	2083.07	2116.57	2100.01	2142.70	2132.15	2196.31	2218.49	2088.25	2045.91	2162.65
18	708.15	726.11	706.75	660.56	717.15	759.60	777.69	740.54	677.53	762.73
19	49.07	44.47	42.14	50.41	44.10	42.64	43.82	41.61	40.52	55.10
20	927.88	915.78	907.72	959.82	949.32	949.62	947.84	893.57	917.31	898.85
21	1299.90	1328.83	1340.48	1277.16	1285.25	1326.66	1375.50	1318.89	1286.32	1361.38
22	1260.29	1252.85	1251.79	1263.21	1264.97	1301.00	1277.96	1227.68	1217.65	1243.60
23	391.79	434.49	413.28	382.85	408.92	422.62	446.21	401.25	397.47	467.01
24	2213.54	2250.92	2220.87	2257.29	2268.44	2306.10	2361.50	2198.91	2159.54	2263.41
25	175.45	162.83	170.59	168.66	197.94	173.92	161.19	151.99	169.62	136.97
26	596.70	586.89	605.76	599.89	619.92	605.90	573.46	564.22	533.57	531.28
27	457.82	476.75	441.48	419.59	455.60	456.11	498.03	442.73	447.76	463.08
28	1047.90	1055.01	1079.67	1035.89	1046.10	1077.00	1086.00	1046.88	1042.94	1030.26
29	1444.09	1493.59	1504.16	1534.04	1514.25	1571.98	1552.86	1512.18	1417.04	1519.72
30	1070.43	1086.31	1112.78	1124.06	1100.48	1109.90	1120.02	1045.00	1032.80	1112.29
31	191.82	209.55	199.51	185.42	200.65	201.59	231.80	217.04	189.95	222.27
32	1991.46	2030.99	2026.54	2078.21	2032.29	2084.17	2112.44	2001.32	1979.09	2066.07
33	857.09	956.85	923.04	938.52	932.31	976.70	1042.54	948.55	880.79	995.15
34	2151.17	2195.52	2194.40	2197.85	2220.16	2233.18	2270.68	2133.84	2106.03	2198.40
35	1124.91	1108.99	1097.31	1167.61	1145.42	1161.26	1168.84	1112.53	1102.37	1148.56
36	281.21	276.73	313.69	332.52	297.74	329.00	295.15	312.39	295.36	285.29
37	1126.73	1085.31	1140.40	1117.73	1164.08	1175.64	1139.45	1103.44	1101.92	1078.70
38	1136.80	1106.21	1162.36	1133.00	1164.80	1189.36	1188.70	1071.55	1088.15	1137.69
39	1450.12	1484.81	1465.47	1469.45	1511.97	1503.81	1537.07	1453.37	1432.93	1434.59
40	2080.32	2127.05	2104.92	2125.48	2159.71	2176.60	2228.95	2072.28	2023.35	2114.48
41	1574.41	1593.23	1588.36	1595.30	1609.00	1651.64	1669.52	1534.01	1569.65	1598.24
42	906.64	846.70	879.85	880.02	914.28	942.60	881.47	876.58	841.85	869.05
43	811.97	784.16	795.85	795.45	824.41	847.12	815.08	803.17	796.08	807.00
44	2103.32	2142.21	2136.27	2150.85	2173.43	2217.44	2265.74	2099.50	2079.61	2168.37
45	471.69	520.50	463.95	509.86	479.85	510.91	563.96	531.59	486.65	528.98
46	777.07	810.90	780.50	759.61	797.89	798.99	797.14	746.50	765.67	788.46
47	864.16	877.29	870.47	837.99	869.68	912.64	893.56	831.02	840.78	875.88
48	2004.67	2061.21	2009.73	2042.33	2101.10	2094.43	2147.52	1992.18	1959.48	2058.77
49	1235.52	1213.13	1232.59	1308.29	1298.09	1283.45	1293.38	1235.92	1186.16	1225.89
50	859.78	842.99	872.34	824.10	847.51	861.46	892.74	777.22	843.79	874.71
	TT11	TT12	TT13	TT14	TT15	TT16	TT17	TT18	TT19	TT20
1	1034.07	1035.12	1004.91	1038.88	1041.31	1077.05	1035.89	1008.34	1012.68	987.64
2	738.28	705.01	711.56	677.98	670.75	709.67	716.49	708.62	724.47	699.69
3	1482.18	1526.44	1413.72	1468.70	1474.44	1503.31	1487.38	1473.13	1472.55	1402.43
4	2214.06	2231.62	2153.72	2219.50	2185.42	2255.19	2251.59	2182.51	2226.69	2141.88
5	1776.64	1796.85	1751.15	1766.22	1753.39	1822.38	1799.95	1770.22	1786.67	1750.36
6	695.28	688.91	691.72	694.13	711.02	728.74	737.95	648.06	677.36	675.78
7	538.09	536.92	541.19	537.79	536.95	556.66	533.98	561.77	565.91	507.80
8	2090.13	2075.97	2037.68	2094.58	2043.23	2122.18	2141.20	2032.64	2083.12	2029.47

9	1656.52	1703.84	1612.43	1684.54	1703.81	1733.88	1726.72	1657.47	1692.11	1621.65
10	1431.34	1451.39	1381.27	1429.17	1422.27	1427.57	1485.64	1417.91	1457.38	1378.28
11	169.17	163.61	162.30	174.92	166.27	175.51	175.01	157.27	161.36	164.86
12	1465.19	1492.37	1449.90	1486.89	1488.04	1494.46	1495.02	1459.78	1506.09	1431.64
13	2139.83	2174.37	2097.24	2168.08	2144.09	2179.75	2187.70	2125.36	2152.30	2084.03
14	1845.99	1875.73	1777.02	1859.60	1872.04	1875.26	1878.66	1824.87	1862.55	1799.91
15	1752.64	1807.04	1739.07	1770.64	1790.67	1781.23	1794.20	1743.18	1779.58	1720.58
16	824.85	841.73	775.01	798.78	799.53	853.41	851.04	835.34	805.45	826.81
17	2126.81	2165.57	2096.15	2144.43	2130.49	2168.01	2155.05	2112.65	2138.27	2083.17
18	748.88	752.53	713.81	696.25	682.88	763.22	750.09	765.76	756.63	689.15
19	51.62	46.23	39.97	41.54	44.29	48.17	39.67	35.68	39.20	46.33
20	925.50	920.04	898.63	959.75	953.39	965.86	953.19	901.77	975.92	916.64
21	1351.32	1331.83	1315.45	1312.64	1296.67	1325.84	1371.36	1298.71	1335.31	1298.96
22	1291.02	1312.55	1241.85	1277.43	1272.05	1279.35	1273.94	1261.58	1242.76	1232.44
23	417.28	455.81	431.31	402.66	421.97	429.04	419.74	437.95	433.13	403.33
24	2266.70	2284.04	2206.78	2271.60	2239.54	2308.96	2305.55	2236.78	2279.58	2194.30
25	168.10	160.55	141.58	175.83	172.40	182.39	187.11	161.45	149.18	152.96
26	571.43	568.90	552.73	586.54	574.70	597.78	588.99	616.88	603.82	563.01
27	470.79	474.88	467.62	456.79	448.64	441.34	463.82	465.82	466.31	443.15
28	1080.07	1052.54	1043.93	1087.96	1052.83	1101.02	1084.77	1032.57	1088.54	1084.44
29	1495.18	1557.12	1452.69	1502.76	1529.21	1553.12	1505.15	1522.81	1497.96	1468.71
30	1094.37	1114.13	1041.61	1078.95	1097.88	1155.35	1136.47	1045.84	1062.10	1058.33
31	193.70	185.56	194.63	203.33	191.18	216.64	222.59	209.60	211.76	215.89
32	2041.22	2075.31	1985.40	2051.20	2053.88	2077.98	2055.11	2035.74	2065.66	2003.45
33	926.80	991.86	940.85	951.04	967.39	954.33	954.45	945.74	938.52	901.74
34	2191.85	2215.15	2138.38	2208.23	2189.98	2261.00	2238.43	2164.13	2218.53	2131.64
35	1172.84	1177.38	1121.49	1109.72	1134.66	1152.41	1132.91	1144.39	1143.84	1098.11
36	312.42	306.89	291.17	316.63	327.63	302.45	301.68	289.40	302.85	299.21
37	1163.23	1129.30	1088.37	1119.07	1116.55	1184.84	1122.62	1137.36	1162.07	1085.17
38	1127.87	1137.58	1099.99	1136.14	1099.29	1162.04	1172.74	1067.12	1105.55	1128.17
39	1471.68	1494.17	1420.83	1471.60	1484.99	1524.62	1544.50	1486.40	1484.63	1424.30
40	2131.71	2162.40	2074.25	2146.30	2133.14	2194.04	2175.98	2116.62	2146.09	2079.51
41	1597.34	1622.93	1589.60	1638.44	1574.57	1623.13	1609.97	1534.23	1618.74	1543.69
42	881.79	900.22	890.42	877.09	874.64	914.24	893.53	875.79	865.70	889.65
43	850.94	828.40	817.49	802.11	812.89	822.50	828.33	833.34	858.10	766.71
44	2158.17	2194.24	2095.37	2190.37	2161.25	2219.43	2224.94	2127.12	2167.43	2098.34
45	510.95	506.32	482.92	510.39	501.48	520.76	549.92	501.88	514.92	494.59
46	801.10	813.98	790.70	789.84	787.06	786.98	797.62	790.34	747.00	813.27
47	895.85	888.37	876.93	864.58	849.57	883.95	902.28	843.48	873.14	904.05
48	2045.18	2081.62	1996.88	2051.23	2058.35	2103.88	2111.12	2046.36	2087.10	1970.96
49	1235.64	1267.88	1211.82	1243.77	1267.66	1324.05	1282.22	1214.91	1252.23	1191.08
50	865.73	878.58	855.36	865.61	818.61	837.72	859.00	825.58	863.38	817.45
	TT21	TT22	TT23	TT24	TT25	TT26	TT27	TT28	TT29	TT30
1	1032.49	1047.73	1010.45	1013.98	1005.28	1014.56	1024.19	991.38	1061.10	1015.38
2	667.65	692.94	699.19	735.99	724.43	690.75	703.99	687.87	700.14	717.79
3	1458.34	1513.11	1437.94	1511.93	1482.61	1455.90	1402.67	1438.04	1449.90	1446.46
4	2182.16	2241.71	2141.06	2232.84	2220.85	2187.32	2141.65	2104.51	2178.29	2140.88
5	1725.71	1828.92	1703.73	1811.64	1788.07	1750.90	1717.55	1717.24	1770.21	1731.94
6	640.75	684.59	672.17	723.27	686.25	678.11	647.55	700.35	699.33	692.63
7	538.55	563.40	537.89	548.53	545.62	510.74	514.07	541.12	531.95	504.90
8	2030.68	2081.00	2004.04	2079.12	2064.57	2040.32	2037.12	1966.17	2066.54	1996.26
9	1689.83	1718.77	1662.06	1702.87	1672.16	1699.86	1652.22	1615.59	1683.15	1637.75
10	1384.26	1418.00	1363.76	1450.32	1423.74	1415.02	1378.29	1343.33	1387.56	1424.40
11	140.60	150.68	147.17	160.53	171.60	182.44	174.20	151.67	164.85	179.47
12	1473.63	1487.79	1455.54	1492.01	1489.04	1476.02	1453.25	1410.70	1502.36	1455.44
13	2119.63	2193.09	2086.26	2150.69	2129.88	2135.34	2073.19	2051.50	2129.90	2070.40
14	1806.43	1886.87	1813.82	1865.13	1848.27	1843.61	1784.64	1812.24	1824.45	1816.51
15	1718.22	1814.04	1735.12	1782.72	1763.68	1757.75	1704.02	1708.09	1745.15	1750.42
16	814.02	832.87	791.79	855.93	806.15	783.92	810.75	770.11	779.26	790.08
17	2107.19	2181.82	2067.75	2171.88	2133.27	2144.23	2073.77	2045.67	2108.54	2105.53
18	707.38	738.09	690.82	732.56	743.62	693.53	714.32	677.53	688.06	712.32
19	46.57	46.81	44.48	45.73	43.10	48.45	39.55	46.82	41.61	43.66
20	927.95	938.21	889.36	907.20	958.89	982.56	930.37	884.43	938.78	904.86
21	1288.63	1317.44	1269.61	1315.98	1318.18	1296.67	1304.84	1240.98	1312.07	1308.52
22	1250.51	1320.67	1225.52	1273.98	1228.71	1236.43	1185.59	1241.33	1273.69	1270.62
23	421.30	433.36	402.61	424.42	436.00	419.63	397.16	396.69	441.52	429.77

24	2235.69	2295.86	2194.92	2286.79	2275.36	2240.61	2195.86	2157.50	2232.08	2192.47
25	189.33	172.24	146.46	182.31	162.81	177.95	160.34	153.04	172.85	164.48
26	612.73	598.77	574.97	620.10	592.39	566.28	566.89	560.36	573.92	533.04
27	423.75	496.30	444.10	471.49	456.51	422.29	423.02	421.18	429.68	442.19
28	1043.36	1081.61	1046.02	1041.19	1055.24	1042.46	1040.60	1047.61	1092.96	1023.93
29	1510.40	1547.93	1478.58	1527.40	1509.66	1537.11	1484.24	1477.04	1511.07	1476.27
30	1054.55	1054.63	1062.31	1091.79	1095.39	1097.63	1078.12	1074.17	1093.07	1061.21
31	204.88	217.42	205.54	220.51	203.16	197.04	215.08	189.71	207.12	167.96
32	2053.61	2086.60	1982.19	2096.10	2060.28	2062.99	2000.88	1979.06	2028.36	2014.04
33	939.00	988.80	946.65	955.82	946.53	940.59	919.59	890.82	949.71	898.30
34	2173.74	2227.63	2127.39	2224.55	2212.45	2169.15	2140.22	2110.61	2182.41	2120.31
35	1148.06	1186.91	1126.78	1162.83	1122.52	1116.81	1092.29	1148.85	1127.69	1144.59
36	300.69	308.81	305.61	284.28	277.81	306.74	310.72	320.38	325.81	299.61
37	1125.49	1161.40	1115.32	1144.30	1147.69	1124.12	1111.81	1116.98	1133.70	1122.64
38	1097.33	1116.96	1075.23	1129.29	1111.60	1110.61	1085.19	1090.71	1118.90	1091.40
39	1450.74	1509.66	1438.40	1541.39	1499.69	1466.81	1425.72	1436.47	1485.18	1446.48
40	2102.66	2169.01	2081.82	2160.93	2155.12	2127.26	2071.56	2055.71	2128.61	2083.06
41	1582.18	1602.99	1524.04	1574.89	1628.76	1619.23	1535.44	1502.27	1595.29	1561.08
42	868.53	865.39	847.32	906.63	886.34	903.01	842.41	897.49	890.41	889.68
43	758.50	816.59	798.67	829.81	810.19	783.66	799.32	792.90	773.62	818.10
44	2120.23	2192.77	2100.09	2199.55	2162.65	2158.98	2100.95	2069.90	2129.23	2110.60
45	501.22	530.24	471.56	520.63	516.30	518.82	515.63	450.64	490.20	471.79
46	757.29	794.51	755.47	824.82	779.33	778.12	748.29	776.26	796.12	789.72
47	836.61	869.34	816.78	910.00	867.14	840.12	828.07	846.64	867.57	852.53
48	2039.10	2090.35	2000.89	2112.61	2066.99	2026.96	2000.91	1960.39	2008.48	1995.33
49	1253.82	1266.38	1226.71	1263.46	1266.71	1276.49	1219.50	1231.72	1261.39	1248.47
50	851.52	856.21	800.14	832.08	854.04	837.34	822.80	780.42	861.90	837.23
	TT31	TT32	TT33	TT34	TT35	TT36	TT37	TT38	TT39	TT40
1	1073.54	1039.20	1027.83	1087.35	994.86	1005.72	1006.32	985.83	1046.38	1017.86
2	700.54	708.09	701.91	716.14	697.31	714.75	687.39	725.32	701.80	691.68
3	1476.15	1466.17	1475.65	1514.97	1463.64	1451.47	1441.32	1479.39	1525.17	1461.71
4	2187.09	2179.98	2149.95	2264.03	2195.04	2212.96	2171.97	2172.62	2244.77	2134.21
5	1753.78	1730.89	1722.32	1856.38	1732.23	1783.63	1734.47	1748.94	1824.09	1723.79
6	709.58	681.71	658.67	707.57	680.68	676.30	681.88	666.90	726.62	683.32
7	512.13	508.31	495.02	548.65	487.40	535.13	543.42	502.04	539.12	510.57
8	2032.03	2040.79	2004.82	2136.30	2034.39	2055.46	2038.26	2028.76	2090.41	2011.62
9	1692.12	1658.79	1661.82	1736.49	1698.50	1636.57	1660.51	1676.56	1711.24	1634.57
10	1388.02	1392.70	1383.16	1424.41	1428.52	1428.76	1409.83	1421.26	1479.03	1364.56
11	177.89	174.00	157.88	179.48	158.79	173.90	177.72	158.55	169.98	153.00
12	1492.11	1451.91	1412.76	1485.10	1478.85	1454.69	1445.90	1437.31	1516.32	1433.38
13	2128.48	2111.23	2085.64	2201.08	2138.06	2146.74	2102.36	2104.66	2182.88	2090.07
14	1850.35	1843.00	1856.72	1893.31	1865.24	1840.68	1802.68	1864.29	1914.02	1811.73
15	1762.00	1747.46	1738.62	1809.73	1776.58	1773.23	1715.51	1759.87	1809.67	1709.44
16	795.83	806.68	835.47	837.22	812.81	814.40	827.44	822.46	834.55	790.45
17	2124.66	2112.02	2095.92	2197.93	2116.15	2131.43	2114.46	2114.37	2186.27	2053.97
18	679.83	693.95	659.76	746.17	697.75	744.78	701.94	726.56	715.61	677.44
19	47.21	49.16	40.53	50.04	47.64	44.73	44.22	44.13	43.79	45.09
20	932.61	910.25	944.07	968.40	920.22	928.30	892.68	900.09	996.17	919.55
21	1254.91	1308.27	1247.13	1335.50	1282.31	1328.12	1324.09	1287.33	1337.01	1275.60
22	1275.97	1269.30	1261.43	1308.13	1247.83	1255.78	1263.39	1243.21	1323.68	1238.25
23	426.51	409.83	387.68	429.73	454.50	435.20	396.51	385.23	456.18	403.96
24	2241.64	2231.20	2203.15	2316.68	2246.88	2266.30	2225.30	2227.03	2297.91	2187.79
25	163.86	166.51	191.26	198.77	161.91	129.77	156.13	153.26	198.01	162.92
26	565.75	560.98	591.16	616.90	540.29	573.14	564.90	580.85	589.09	559.39
27	450.90	435.70	424.05	462.96	454.27	480.33	431.47	468.13	457.87	466.28
28	1036.27	1053.93	1045.56	1082.57	1052.44	1104.44	1064.73	1061.12	1046.72	1065.29
29	1497.88	1516.08	1491.80	1580.27	1490.51	1497.04	1505.63	1495.24	1552.92	1427.49
30	1098.85	1094.24	1046.07	1144.13	1096.97	1066.27	1069.70	1080.73	1107.62	1046.83
31	173.96	184.88	175.75	214.14	201.43	200.19	214.74	189.11	197.85	201.05
32	2034.63	2023.56	2019.25	2111.43	2025.98	2041.78	2048.33	2017.58	2111.06	1978.01
33	981.98	945.18	908.92	982.91	984.02	968.55	911.78	952.79	964.94	922.22
34	2185.01	2141.34	2132.52	2265.90	2159.65	2173.62	2153.45	2152.53	2236.50	2133.38
35	1157.26	1150.45	1110.87	1173.37	1135.10	1154.09	1138.12	1146.65	1164.52	1110.19
36	315.27	301.65	284.24	319.70	288.59	313.98	307.26	300.73	306.69	283.62
37	1125.16	1129.87	1130.41	1171.78	1094.41	1106.95	1109.18	1126.20	1141.12	1101.99
38	1123.77	1116.48	1081.23	1143.09	1137.00	1147.82	1091.34	1119.50	1154.26	1106.08

39	1465.16	1442.33	1494.58	1524.26	1506.81	1436.63	1457.59	1466.49	1564.86	1461.55
40	2126.39	2113.88	2089.10	2195.30	2137.58	2143.58	2096.63	2101.93	2176.43	2066.63
41	1603.67	1587.10	1561.40	1641.53	1592.39	1630.54	1529.23	1586.54	1637.09	1559.79
42	887.54	866.80	827.18	899.75	856.63	888.96	851.12	867.08	886.04	832.42
43	807.94	773.31	776.74	815.19	776.35	802.75	795.04	822.82	809.53	777.92
44	2134.64	2141.10	2111.17	2234.69	2148.95	2141.63	2143.14	2148.26	2217.00	2095.05
45	490.36	471.47	487.84	525.37	520.68	521.66	523.50	494.09	541.77	506.86
46	776.54	794.23	781.77	822.71	791.69	786.38	774.63	775.40	824.85	755.34
47	860.92	832.26	822.90	874.90	866.02	899.84	845.57	863.31	895.35	857.35
48	2044.63	1987.75	2014.08	2099.74	2020.46	2041.22	2005.69	2030.16	2104.29	1993.93
49	1297.95	1229.87	1226.68	1312.61	1245.39	1203.11	1208.14	1256.90	1273.53	1218.06
50	832.16	882.29	843.61	899.83	868.02	878.36	823.19	808.01	896.89	840.00
	TT41	TT42	TT43	TT44	TT45	TT46	TT47	TT48	TT49	TT50
1	1053.81	1044.03	1050.59	1032.99	1067.81	1013.49	1026.20	1048.69	1044.57	1076.88
2	723.03	729.55	701.41	737.43	773.06	715.54	714.51	700.10	711.25	722.91
3	1495.86	1516.57	1507.05	1509.49	1504.54	1474.17	1457.39	1484.52	1433.93	1522.98
4	2244.78	2274.01	2220.16	2293.54	2275.59	2187.39	2196.70	2212.16	2213.19	2240.06
5	1788.36	1830.73	1748.27	1857.46	1839.38	1744.90	1767.62	1766.26	1789.87	1774.10
6	711.74	721.51	700.68	696.79	719.85	672.15	697.57	681.98	652.87	733.29
7	552.08	565.79	504.31	521.10	538.52	539.16	544.30	518.37	520.43	548.99
8	2104.74	2124.44	2062.52	2150.45	2109.72	2026.21	2073.79	2068.80	2087.46	2056.67
9	1690.68	1744.66	1703.07	1712.84	1715.96	1654.35	1666.86	1689.46	1668.20	1735.15
10	1447.32	1450.47	1397.09	1497.32	1450.73	1423.27	1415.56	1421.33	1401.93	1443.67
11	183.03	158.81	169.23	177.03	184.71	171.01	166.95	170.30	165.47	190.32
12	1481.88	1526.29	1475.23	1506.78	1490.99	1464.98	1468.31	1462.19	1491.97	1502.71
13	2181.99	2220.60	2160.40	2231.15	2188.05	2125.51	2136.26	2140.92	2137.00	2170.50
14	1866.45	1910.37	1900.39	1892.54	1925.97	1833.56	1837.80	1826.03	1852.61	1921.01
15	1800.48	1839.87	1766.50	1828.03	1833.94	1777.29	1757.56	1733.28	1775.86	1790.23
16	830.67	831.09	850.44	876.06	853.35	793.13	777.17	831.87	830.77	808.73
17	2174.48	2201.65	2133.50	2227.59	2206.35	2123.70	2123.57	2125.14	2132.61	2151.35
18	739.55	737.73	698.30	731.29	760.36	701.78	717.29	732.69	711.34	729.43
19	45.21	48.30	51.11	46.87	44.16	47.50	45.73	40.88	48.80	46.23
20	934.07	970.47	930.81	1006.24	948.69	897.15	913.36	917.06	952.11	908.21
21	1346.70	1342.33	1302.69	1348.25	1329.81	1296.64	1335.08	1304.02	1313.13	1309.54
22	1270.92	1305.05	1284.88	1314.97	1337.74	1267.12	1283.64	1285.11	1266.06	1327.56
23	422.75	437.17	391.38	426.89	410.82	450.05	404.37	415.00	424.93	442.13
24	2298.03	2328.47	2274.29	2346.55	2328.72	2242.16	2249.46	2266.01	2265.32	2292.30
25	167.41	178.50	176.68	173.10	167.83	133.05	164.78	173.28	157.88	168.04
26	592.02	608.55	577.84	585.53	577.77	553.86	568.98	567.17	588.60	575.92
27	460.85	479.09	479.70	481.33	466.45	456.90	474.37	449.83	441.60	470.39
28	1087.21	1081.84	1042.45	1118.35	1116.77	1040.01	1055.39	1071.90	1086.00	1106.86
29	1547.57	1562.95	1501.22	1541.55	1567.47	1504.55	1491.72	1512.00	1515.50	1524.19
30	1119.32	1121.42	1128.09	1081.38	1110.67	1063.55	1108.39	1110.94	1113.56	1107.03
31	202.84	219.32	184.96	218.10	200.42	195.17	203.55	210.45	202.74	189.16
32	2083.74	2103.74	2031.39	2137.22	2110.09	2032.04	2022.31	2034.97	2053.38	2067.11
33	964.99	973.11	982.33	967.69	974.79	982.92	939.11	966.40	955.21	966.47
34	2233.03	2263.01	2175.84	2261.26	2220.19	2160.64	2180.91	2190.87	2198.40	2217.71
35	1164.73	1193.02	1147.59	1182.94	1249.85	1150.43	1162.99	1145.24	1143.81	1231.27
36	312.65	318.58	293.53	325.09	342.03	292.65	319.27	296.57	327.47	324.17
37	1178.85	1171.77	1136.09	1173.77	1219.35	1100.34	1153.12	1130.94	1142.57	1164.10
38	1136.50	1171.84	1155.22	1146.39	1161.83	1093.88	1118.84	1135.83	1129.34	1135.00
39	1485.01	1506.62	1488.67	1547.58	1526.63	1478.49	1460.90	1486.20	1460.14	1512.79
40	2185.52	2207.22	2141.93	2212.32	2209.75	2129.24	2128.47	2138.20	2148.74	2178.40
41	1620.56	1634.32	1609.00	1655.95	1629.52	1594.23	1590.18	1603.64	1614.21	1587.22
42	901.16	922.08	833.96	881.96	902.48	884.68	897.57	860.40	870.05	881.64
43	824.45	852.59	797.35	869.60	857.67	797.63	834.47	779.33	813.58	828.30
44	2205.61	2232.76	2190.32	2240.82	2226.52	2122.95	2152.71	2177.36	2158.03	2186.13
45	479.31	502.07	535.38	559.76	529.00	486.58	499.96	523.77	500.78	509.84
46	822.80	835.70	767.15	819.01	818.23	797.32	783.84	778.02	786.26	815.49
47	867.31	916.36	834.76	928.17	897.84	843.91	864.57	850.34	860.10	885.59
48	2091.07	2126.30	2058.39	2116.64	2075.95	2028.32	2035.98	2047.48	2028.72	2076.44
49	1274.56	1279.66	1257.13	1270.57	1294.82	1231.68	1274.79	1250.44	1249.30	1285.95
50	857.58	877.30	885.61	901.49	890.85	828.31	826.28	854.70	892.30	852.52
	TT51	TT52	TT53	TT54	TT55	TT56	TT57	TT58	TT59	TT60
1	1045.76	1079.99	1018.82	1016.58	1034.36	1039.35	1074.88	1047.97	1062.38	1023.40
2	733.84	725.79	717.77	736.04	683.77	677.36	723.03	701.68	694.46	711.58

3	1518.63	1497.49	1501.21	1470.31	1444.36	1493.65	1515.50	1454.38	1522.29	1459.55
4	2228.39	2192.71	2209.91	2183.09	2151.02	2212.14	2255.66	2205.61	2239.83	2188.57
5	1815.44	1787.58	1783.28	1785.18	1751.92	1774.78	1841.84	1771.38	1807.50	1757.90
6	725.75	717.33	711.73	715.68	714.38	730.30	728.85	712.46	735.69	698.79
7	535.38	515.95	539.00	569.33	495.13	556.58	562.55	522.92	520.72	537.10
8	2078.91	2057.62	2068.32	2056.17	2058.03	2067.47	2114.33	2082.34	2087.63	2058.84
9	1674.71	1676.47	1698.22	1672.16	1657.87	1709.65	1718.40	1686.71	1719.33	1644.58
10	1444.27	1373.26	1439.42	1411.58	1394.54	1428.39	1459.23	1432.68	1425.98	1400.66
11	191.24	169.41	164.44	162.16	167.82	154.82	175.19	179.72	160.93	170.05
12	1439.99	1476.62	1476.77	1486.09	1470.49	1482.28	1500.11	1483.00	1486.85	1436.74
13	2153.89	2135.48	2157.56	2113.83	2096.85	2174.98	2175.69	2138.44	2186.31	2131.22
14	1882.94	1839.18	1855.21	1829.93	1805.10	1885.94	1914.78	1839.61	1908.76	1803.38
15	1780.16	1765.72	1775.69	1765.77	1738.03	1773.36	1802.30	1778.15	1800.40	1747.73
16	815.56	798.33	806.25	788.18	797.00	813.21	831.80	834.07	815.09	828.50
17	2167.09	2127.59	2132.56	2113.56	2085.80	2140.59	2186.74	2140.30	2180.37	2101.71
18	745.54	678.13	703.54	749.67	720.60	685.49	742.93	732.61	718.45	706.16
19	45.54	47.06	46.05	41.23	44.35	44.42	42.87	51.73	41.50	43.06
20	962.41	963.23	980.82	910.29	929.53	967.59	971.90	931.23	937.24	922.89
21	1320.22	1274.21	1293.04	1319.53	1333.62	1290.78	1343.74	1323.68	1317.24	1305.40
22	1285.68	1263.59	1263.82	1211.79	1217.34	1289.67	1323.67	1261.25	1329.94	1251.76
23	406.94	415.20	414.40	439.83	415.21	424.99	426.29	450.84	406.06	420.89
24	2282.25	2246.35	2263.97	2235.46	2205.04	2265.31	2308.62	2260.30	2294.27	2239.32
25	164.17	181.94	186.70	165.58	168.56	169.03	168.99	160.79	184.30	156.31
26	586.56	612.81	616.34	586.67	549.48	585.61	580.03	532.28	579.66	575.92
27	489.40	442.62	438.16	444.89	426.83	461.08	456.18	449.11	491.20	444.09
28	1044.38	1066.35	1051.32	1049.91	1065.01	1072.24	1074.27	1059.43	1076.42	1036.47
29	1501.20	1517.53	1521.07	1511.79	1498.00	1510.39	1565.12	1500.42	1516.70	1494.69
30	1105.35	1081.42	1071.19	1096.55	1121.02	1080.99	1152.48	1103.56	1108.43	1105.45
31	194.10	183.11	208.95	207.38	183.98	218.57	197.67	218.70	195.45	202.59
32	2069.91	2049.59	2064.72	2045.45	1987.94	2046.34	2098.49	2042.49	2068.30	2026.45
33	941.49	946.94	933.69	936.30	938.94	949.53	965.53	961.88	957.80	931.58
34	2218.23	2199.06	2206.95	2191.05	2166.31	2194.01	2254.39	2195.44	2235.15	2183.45
35	1172.07	1115.66	1135.42	1129.42	1070.49	1147.57	1185.68	1123.27	1191.60	1139.99
36	299.20	290.07	306.71	294.62	320.32	332.66	334.44	303.00	314.19	291.96
37	1136.45	1160.48	1129.57	1143.72	1097.45	1107.22	1166.30	1087.22	1167.68	1109.66
38	1171.30	1116.52	1107.32	1121.25	1157.53	1182.57	1191.26	1170.74	1176.72	1120.01
39	1484.28	1495.56	1533.88	1478.61	1429.96	1490.74	1516.13	1479.61	1495.93	1463.36
40	2140.37	2144.08	2148.98	2126.53	2088.11	2136.16	2184.05	2144.66	2159.56	2110.23
41	1642.75	1617.68	1588.18	1567.39	1614.53	1593.77	1647.58	1589.06	1645.65	1562.22
42	899.13	879.59	904.60	915.99	898.53	871.10	941.02	879.20	922.60	904.39
43	838.04	778.34	820.52	815.63	769.18	792.27	829.16	786.74	829.62	820.74
44	2190.16	2141.46	2169.38	2136.04	2132.90	2163.94	2204.91	2172.73	2215.96	2128.28
45	534.29	465.03	529.86	488.37	483.36	519.82	520.79	530.20	490.16	497.86
46	772.12	781.05	783.05	782.76	768.03	776.04	802.77	792.10	814.66	792.25
47	888.29	842.03	879.39	882.27	867.25	892.71	914.15	899.02	892.05	870.07
48	2099.42	2044.32	2094.68	2050.77	2003.16	2048.77	2092.78	2057.03	2082.07	2048.26
49	1288.60	1299.62	1289.11	1270.86	1272.07	1239.51	1307.20	1243.65	1301.83	1229.63
50	856.72	860.32	806.56	844.09	833.67	870.86	871.09	861.58	861.39	842.98
	TT61	TT62	TT63	TT64	TT65	TT66	TT67	TT68	TT69	TT70
1	1021.64	1068.41	1004.79	984.52	1057.07	1011.00	997.81	1067.34	1069.84	1016.00
2	707.89	706.16	717.88	720.35	737.84	672.47	682.25	719.78	733.90	716.80
3	1478.59	1482.10	1446.73	1482.46	1506.84	1466.04	1446.79	1499.64	1482.42	1462.77
4	2247.92	2233.25	2192.19	2141.20	2246.37	2176.25	2182.83	2272.09	2253.34	2188.80
5	1804.68	1783.24	1784.99	1722.36	1802.46	1754.54	1741.92	1837.64	1825.77	1754.33
6	690.40	706.36	662.23	699.21	743.37	675.67	654.71	726.56	697.90	682.93
7	552.51	563.51	527.52	518.89	520.50	542.07	505.04	536.36	536.84	524.60
8	2071.82	2108.30	2077.37	2006.98	2138.92	2056.01	2045.25	2114.02	2109.68	2024.18
9	1703.16	1697.88	1667.27	1597.61	1663.26	1676.28	1661.57	1701.03	1711.88	1652.97
10	1481.78	1406.60	1386.19	1374.54	1412.73	1413.52	1411.18	1459.45	1456.13	1386.19
11	186.18	169.50	149.32	156.73	172.37	146.64	158.17	172.81	187.56	163.26
12	1522.81	1480.29	1454.15	1408.03	1465.25	1455.79	1461.39	1547.55	1497.64	1466.19
13	2161.66	2183.77	2128.81	2081.79	2200.59	2119.40	2131.87	2197.29	2176.93	2107.60
14	1859.76	1859.53	1807.92	1788.47	1854.05	1832.78	1837.98	1871.34	1891.96	1819.86
15	1785.60	1777.06	1768.48	1705.25	1788.72	1751.31	1738.25	1824.34	1802.90	1740.48
16	859.96	815.17	797.05	785.66	820.92	833.97	802.89	836.20	853.69	794.01
17	2169.99	2144.62	2128.97	2042.33	2161.88	2131.21	2121.27	2186.68	2211.95	2119.89

18	776.30	714.02	727.03	703.50	733.07	722.98	716.30	752.40	730.38	752.36
19	42.15	40.30	44.23	43.90	51.12	44.00	40.74	51.41	49.94	44.08
20	932.32	942.88	920.43	920.74	981.34	942.78	930.82	918.62	960.19	885.09
21	1323.84	1326.83	1296.89	1267.29	1365.99	1314.55	1315.38	1348.06	1373.82	1311.32
22	1272.25	1300.03	1239.73	1207.15	1291.57	1243.30	1251.26	1303.01	1318.09	1265.12
23	457.51	410.98	415.53	403.78	410.28	404.66	401.37	488.47	431.76	425.48
24	2301.27	2285.40	2244.89	2193.57	2301.00	2230.50	2236.38	2325.79	2306.80	2242.49
25	146.21	175.64	164.16	157.08	158.99	173.15	173.58	165.99	173.79	166.79
26	568.38	593.04	560.56	561.97	582.36	561.43	577.66	555.45	589.43	571.45
27	457.31	466.02	485.77	470.91	485.88	436.74	467.78	487.82	457.88	482.81
28	1098.42	1109.67	1035.33	996.64	1102.18	1041.60	1066.72	1051.76	1101.03	1040.72
29	1527.05	1532.54	1466.25	1440.89	1515.64	1499.41	1479.33	1540.75	1563.86	1489.74
30	1102.93	1105.43	1064.21	1083.77	1121.38	1106.85	1067.79	1141.15	1139.23	1066.73
31	218.58	205.84	221.18	193.13	178.38	193.17	188.80	220.74	202.85	187.83
32	2102.71	2051.62	2008.76	1965.35	2057.69	2054.06	2040.88	2096.80	2122.49	2010.02
33	958.12	957.39	944.02	931.56	944.10	924.32	932.21	1036.61	945.35	949.80
34	2241.10	2209.78	2184.57	2138.43	2239.39	2181.27	2164.35	2259.43	2238.98	2154.70
35	1187.91	1154.13	1114.34	1106.18	1161.61	1129.03	1147.81	1189.40	1186.99	1160.23
36	316.86	320.71	284.79	266.94	313.94	286.30	315.77	320.76	328.59	298.41
37	1157.73	1161.13	1125.71	1096.45	1140.48	1142.35	1133.55	1124.03	1173.87	1134.78
38	1151.80	1130.34	1115.75	1122.83	1175.79	1133.54	1122.76	1194.53	1135.26	1100.22
39	1483.41	1468.54	1461.87	1451.41	1460.98	1437.10	1442.85	1516.00	1490.33	1443.94
40	2174.09	2168.55	2111.19	2059.39	2155.51	2095.05	2101.24	2201.99	2195.06	2122.70
41	1611.75	1595.55	1598.27	1582.55	1674.62	1607.83	1613.53	1650.12	1616.16	1602.06
42	884.99	858.87	879.46	852.10	907.09	901.52	877.35	875.06	916.92	883.61
43	842.75	809.45	824.63	794.58	872.96	822.38	805.52	799.05	837.52	800.21
44	2207.10	2185.29	2137.13	2095.15	2200.34	2163.22	2140.39	2227.96	2218.25	2143.17
45	523.75	498.20	509.98	491.15	505.91	489.10	515.11	529.61	507.71	486.73
46	799.11	806.12	770.94	759.03	806.94	766.95	770.36	830.38	840.17	794.37
47	910.51	858.08	866.47	839.57	905.78	878.37	863.33	906.06	902.69	843.24
48	2090.88	2047.12	2042.92	2014.61	2085.91	2045.85	2022.81	2107.49	2098.48	2035.57
49	1259.77	1237.95	1263.51	1220.93	1266.84	1252.17	1255.53	1270.44	1269.00	1254.19
50	845.51	890.62	836.70	821.54	907.94	860.25	861.17	932.08	888.97	856.98
	TT71	TT72	TT73	TT74	TT75	TT76	TT77	TT78	TT79	TT80
1	1023.95	1033.58	1028.69	1050.40	1044.23	1011.26	1005.05	1009.62	1040.17	1022.43
2	716.40	708.60	710.55	738.78	709.98	710.17	699.56	679.88	738.18	721.98
3	1477.57	1422.98	1487.50	1437.52	1460.92	1464.05	1487.43	1482.64	1471.37	1467.38
4	2169.16	2186.59	2216.25	2133.82	2189.14	2159.26	2193.11	2208.93	2235.26	2190.34
5	1768.27	1747.50	1775.67	1704.70	1755.04	1735.55	1728.95	1786.52	1804.07	1730.50
6	714.71	668.86	712.98	685.93	687.81	683.76	670.42	700.59	715.01	672.88
7	521.79	522.10	523.77	531.77	496.31	516.71	518.07	552.17	554.75	552.20
8	2038.02	2066.10	2087.49	2056.36	2072.49	2048.07	2049.64	2047.58	2100.61	2058.41
9	1680.02	1677.54	1684.38	1650.27	1617.70	1666.90	1703.19	1667.75	1711.01	1647.71
10	1402.12	1409.99	1428.50	1404.45	1383.15	1373.94	1428.84	1447.28	1433.70	1384.69
11	153.71	173.13	165.93	203.44	155.18	164.43	159.84	149.33	174.65	170.49
12	1446.03	1481.30	1458.87	1400.97	1458.68	1427.33	1464.26	1458.80	1511.25	1467.54
13	2119.07	2111.26	2165.77	2055.15	2132.97	2100.17	2157.45	2150.69	2150.31	2119.22
14	1839.37	1817.14	1862.79	1812.44	1830.81	1822.16	1866.39	1851.71	1860.07	1816.22
15	1772.98	1754.39	1778.28	1700.39	1748.96	1739.01	1779.51	1784.01	1801.98	1712.73
16	819.32	811.84	835.97	809.29	836.00	788.50	804.39	841.08	804.55	792.25
17	2113.26	2101.17	2144.51	2069.56	2087.40	2078.08	2123.03	2157.79	2153.46	2095.82
18	704.36	719.25	721.50	703.41	736.49	717.16	690.46	716.37	735.15	700.25
19	38.98	43.22	44.38	46.10	43.96	46.77	46.57	40.00	41.21	42.04
20	917.65	925.93	936.01	917.34	912.49	924.23	942.77	937.94	941.18	905.68
21	1288.31	1326.60	1333.91	1307.69	1333.61	1281.15	1305.81	1308.41	1322.35	1309.12
22	1271.12	1238.07	1278.14	1194.32	1271.06	1207.54	1276.35	1284.92	1229.89	1257.63
23	407.49	423.99	405.01	358.90	427.16	376.11	415.41	444.55	442.21	401.62
24	2222.41	2239.41	2269.75	2186.51	2241.75	2211.99	2246.02	2261.94	2290.80	2242.12
25	168.15	165.02	146.96	167.96	193.02	187.21	176.74	165.98	172.62	163.52
26	568.16	561.76	571.04	553.21	588.28	617.45	558.54	573.10	609.66	609.35
27	453.25	429.82	482.83	398.88	448.93	441.49	468.07	459.82	431.29	457.92
28	1053.46	1049.62	1104.71	1030.16	1072.28	1049.13	1053.41	1054.12	1060.57	1061.21
29	1515.66	1508.48	1496.08	1476.47	1503.60	1490.91	1499.23	1507.64	1538.02	1490.27
30	1082.37	1141.31	1091.98	1136.13	1111.25	1064.97	1083.08	1067.34	1125.54	1067.68
31	194.26	200.62	198.21	179.01	171.09	201.09	191.77	194.93	211.43	191.45
32	2021.54	2026.40	2045.48	2003.15	2005.03	1996.37	2043.93	2082.22	2072.98	2019.56

33	973.47	954.73	956.82	880.24	944.79	906.71	958.36	985.59	992.34	917.73
34	2160.08	2174.59	2199.17	2145.82	2163.66	2157.83	2161.14	2190.81	2228.16	2159.95
35	1154.81	1134.52	1134.78	1116.87	1144.55	1083.89	1162.86	1157.62	1120.81	1143.47
36	313.25	318.56	296.19	300.10	326.16	286.12	297.87	297.80	299.38	290.05
37	1115.72	1124.34	1124.43	1120.27	1138.67	1136.94	1129.97	1073.63	1134.75	1156.32
38	1102.33	1100.05	1157.64	1099.13	1165.34	1106.54	1122.78	1138.52	1139.59	1097.55
39	1487.17	1460.89	1474.95	1443.72	1459.51	1469.71	1468.02	1496.29	1523.09	1436.49
40	2105.43	2123.64	2142.60	2065.74	2124.83	2094.42	2122.20	2135.91	2175.99	2110.38
41	1558.07	1567.65	1616.28	1529.63	1624.46	1565.86	1598.83	1608.33	1627.33	1587.22
42	887.97	870.07	877.66	901.90	903.91	849.19	855.46	919.60	885.02	869.78
43	813.21	802.23	819.12	813.76	785.81	785.18	808.35	788.77	795.23	808.94
44	2141.57	2144.43	2175.46	2101.09	2138.81	2131.23	2158.52	2158.52	2188.20	2114.58
45	501.05	513.44	515.85	483.44	485.72	482.44	512.36	546.11	529.51	465.41
46	801.35	768.26	783.76	764.19	831.75	750.35	801.37	805.98	778.35	790.66
47	887.98	838.54	893.80	836.02	886.06	803.64	861.02	934.20	868.44	845.01
48	2044.24	2041.95	2054.70	2008.98	2014.53	2003.79	2018.66	2091.12	2098.72	1990.14
49	1253.27	1250.31	1255.51	1282.95	1223.87	1267.12	1244.76	1232.57	1287.83	1219.54
50	824.21	863.68	851.69	801.91	919.31	801.99	855.64	868.91	867.55	861.88
	TT81	TT82	TT83	TT84	TT85	TT86	TT87	TT88	TT89	TT90
1	984.65	1036.83	1002.24	1025.05	1053.53	1035.18	1045.28	1013.65	1014.42	1011.02
2	690.31	688.04	685.14	692.98	748.94	714.39	721.94	678.09	699.15	696.01
3	1424.53	1499.35	1452.69	1495.36	1481.82	1510.05	1514.72	1441.22	1483.60	1458.52
4	2109.88	2226.52	2134.66	2211.40	2227.56	2215.69	2237.71	2137.27	2158.67	2188.37
5	1668.41	1793.37	1716.11	1762.67	1818.46	1774.57	1824.02	1699.34	1735.69	1761.28
6	637.37	707.11	666.10	721.90	725.24	727.85	713.64	655.92	673.40	687.82
7	532.42	528.62	508.68	549.34	578.55	525.01	497.34	520.61	504.13	544.46
8	2002.13	2100.01	2017.62	2078.91	2099.83	2059.88	2100.45	2020.52	2017.71	2052.35
9	1633.97	1722.06	1647.20	1675.25	1709.62	1695.75	1711.88	1651.42	1632.39	1678.03
10	1347.98	1399.14	1380.10	1440.86	1454.22	1441.77	1488.80	1387.30	1397.46	1423.10
11	148.19	150.73	169.13	165.35	183.27	155.51	187.04	150.43	166.08	157.59
12	1407.66	1486.93	1426.77	1479.63	1489.17	1493.03	1480.86	1431.17	1422.64	1474.00
13	2057.43	2186.86	2102.80	2185.55	2153.70	2166.92	2195.21	2085.57	2101.47	2129.74
14	1771.75	1854.43	1804.64	1845.42	1877.57	1903.68	1877.06	1831.16	1825.62	1842.28
15	1689.78	1777.53	1720.95	1773.75	1811.69	1813.32	1815.31	1711.68	1707.64	1790.05
16	785.56	794.48	804.34	796.71	823.36	821.01	828.11	823.23	790.24	815.37
17	2041.30	2156.28	2085.99	2119.59	2173.66	2146.62	2173.27	2080.95	2071.93	2129.41
18	678.60	731.10	686.22	717.27	752.24	722.57	742.32	701.85	698.68	709.87
19	42.97	43.72	45.05	32.88	43.17	49.97	40.73	48.73	46.40	44.88
20	914.11	968.68	937.76	955.28	954.15	901.54	925.43	916.07	949.99	917.36
21	1273.52	1315.77	1288.86	1313.97	1354.01	1338.42	1343.34	1303.09	1282.44	1304.82
22	1177.40	1261.07	1239.84	1245.69	1271.76	1315.03	1322.60	1244.47	1252.82	1260.15
23	362.89	412.56	406.14	429.67	436.20	435.35	441.80	385.24	404.62	441.62
24	2161.81	2279.77	2187.61	2263.67	2280.89	2269.44	2289.55	2189.87	2210.39	2241.45
25	161.22	195.46	172.35	192.52	164.78	155.29	166.74	177.89	173.87	154.44
26	598.75	609.07	562.22	609.07	593.13	548.22	552.07	577.44	569.93	547.45
27	441.23	472.00	431.34	460.46	436.71	491.17	472.81	429.19	468.88	454.81
28	1045.57	1062.23	1053.42	1107.83	1068.98	1063.51	1107.39	1027.74	1064.72	1042.21
29	1440.39	1516.42	1480.76	1495.10	1581.00	1530.89	1554.76	1482.99	1450.19	1496.19
30	996.51	1073.80	1047.07	1036.58	1133.95	1105.81	1130.88	1073.41	1063.55	1097.50
31	204.30	217.38	198.61	214.59	202.62	187.02	197.11	193.50	188.39	202.83
32	1962.95	2055.48	2014.69	2062.34	2082.43	2041.82	2082.64	2004.55	2003.51	2033.81
33	890.53	943.89	889.15	957.21	963.30	993.34	1004.20	884.02	904.02	960.30
34	2095.76	2221.35	2128.33	2206.70	2223.71	2181.01	2229.92	2125.26	2157.02	2180.49
35	1072.09	1143.98	1099.26	1139.45	1153.80	1170.51	1196.43	1126.71	1143.10	1120.04
36	298.35	317.02	284.96	308.75	324.58	308.01	336.68	319.55	294.35	283.99
37	1100.54	1166.75	1111.81	1127.58	1145.12	1123.92	1146.58	1126.16	1120.64	1074.56
38	1038.99	1127.26	1083.86	1155.07	1138.72	1189.00	1155.29	1097.61	1103.26	1137.35
39	1413.38	1508.96	1440.61	1500.07	1493.59	1472.54	1525.89	1436.75	1457.72	1464.28
40	2039.32	2149.61	2068.49	2139.77	2167.99	2150.26	2166.16	2067.21	2081.26	2129.30
41	1517.56	1622.74	1552.19	1633.42	1590.49	1600.15	1639.76	1517.38	1591.20	1581.18
42	810.78	906.69	864.40	874.81	919.49	882.99	889.01	882.41	841.58	890.94
43	804.59	838.15	806.44	784.32	835.71	787.16	830.78	819.36	796.56	782.83
44	2064.53	2186.78	2117.63	2174.27	2185.97	2173.88	2218.16	2102.90	2113.71	2156.29
45	495.86	523.57	498.05	516.51	506.44	491.10	529.60	491.17	494.06	495.67
46	714.56	764.68	778.09	809.20	817.56	817.43	822.30	761.05	771.19	796.58
47	808.12	870.48	841.89	891.09	898.54	892.18	895.62	851.44	852.88	879.82

48	1978.99	2069.92	1985.26	2061.77	2093.86	2039.37	2075.06	2004.87	2012.91	2053.48
49	1200.67	1315.20	1206.31	1228.67	1258.72	1238.84	1288.77	1225.00	1230.11	1241.47
50	790.26	857.60	827.89	878.58	854.57	863.79	861.78	819.24	856.89	861.61
	TT91	TT92	TT93	TT94	TT95	TT96	TT97	TT98	TT99	TT100
1	1027.19	1004.11	1001.78	1009.08	1024.13	1047.53	1033.87	1013.72	1027.62	1010.55
2	690.14	718.59	696.02	708.50	670.66	717.42	707.78	690.79	686.91	715.07
3	1449.47	1485.46	1487.65	1467.85	1462.56	1512.95	1478.33	1450.12	1422.22	1472.96
4	2193.64	2214.18	2198.26	2174.76	2195.41	2270.76	2186.74	2128.95	2124.03	2143.69
5	1798.93	1815.71	1761.74	1737.80	1757.85	1829.69	1775.84	1706.37	1691.03	1707.87
6	699.63	702.91	681.53	666.13	652.65	729.28	658.71	672.63	683.95	659.68
7	542.62	544.44	510.96	524.72	536.31	531.16	515.50	516.99	551.25	526.60
8	2092.86	2059.23	2044.11	2016.37	2035.72	2097.24	2051.76	1974.46	2028.30	2011.32
9	1660.07	1701.03	1665.14	1647.75	1704.49	1700.75	1686.29	1608.64	1679.02	1646.40
10	1433.89	1461.60	1440.89	1402.22	1380.97	1393.07	1421.76	1331.05	1379.05	1364.45
11	153.18	177.88	161.32	179.71	151.33	154.37	172.22	143.87	181.20	157.04
12	1468.77	1461.56	1451.05	1402.76	1472.15	1490.94	1473.97	1417.58	1431.42	1432.92
13	2131.92	2144.94	2136.81	2115.42	2138.09	2185.34	2121.97	2047.10	2076.47	2081.70
14	1821.02	1861.65	1846.15	1821.95	1862.02	1913.32	1860.33	1809.03	1802.31	1817.77
15	1769.45	1798.24	1763.41	1756.54	1739.87	1801.27	1759.23	1693.20	1714.13	1710.52
16	840.64	805.57	817.16	808.37	826.89	871.05	808.15	799.72	741.17	791.44
17	2145.95	2182.32	2130.80	2115.41	2134.29	2180.72	2126.26	2070.11	2071.20	2066.01
18	730.12	749.23	726.26	700.79	682.08	741.65	704.79	710.72	669.98	683.17
19	45.73	38.74	44.66	51.42	45.39	45.17	42.06	44.88	45.93	46.71
20	944.97	921.46	920.81	917.33	966.31	1003.22	917.91	882.59	927.97	915.82
21	1353.44	1320.10	1323.73	1272.84	1252.88	1296.89	1301.94	1257.75	1284.20	1253.91
22	1266.41	1287.85	1277.84	1239.92	1284.84	1314.37	1295.03	1249.66	1203.15	1222.17
23	421.79	421.36	422.98	404.80	411.47	406.33	405.54	388.90	386.47	389.97
24	2246.81	2267.86	2250.17	2228.05	2248.27	2325.15	2240.04	2181.42	2176.80	2196.15
25	165.96	154.58	157.40	153.16	182.56	199.42	144.92	158.30	159.61	179.73
26	559.14	533.30	540.52	538.58	593.21	622.44	550.98	561.96	561.89	595.05
27	444.03	481.23	476.48	472.25	443.15	481.58	479.03	451.82	418.56	432.76
28	1053.21	1054.54	1056.39	1035.04	1041.84	1085.63	1056.80	1025.29	1038.63	1034.76
29	1511.82	1522.39	1493.09	1469.83	1493.76	1525.51	1512.69	1477.55	1460.58	1464.88
30	1082.05	1076.69	1097.03	1062.05	1067.10	1097.34	1092.45	1058.49	1062.18	1041.51
31	210.73	231.84	191.01	200.16	219.44	188.75	192.17	167.25	207.23	184.27
32	2060.74	2070.49	2047.62	2021.89	2052.01	2079.88	2037.66	1983.40	1967.04	2011.45
33	923.16	963.44	952.39	958.67	915.79	917.42	957.55	910.79	894.27	894.48
34	2199.94	2196.03	2185.68	2151.32	2175.20	2239.29	2185.58	2110.77	2142.91	2134.84
35	1109.70	1165.30	1170.66	1169.67	1149.57	1169.08	1146.41	1141.16	1046.90	1124.40
36	321.67	300.66	296.55	291.82	293.22	301.14	319.95	306.91	283.45	283.52
37	1103.83	1152.65	1113.91	1104.96	1155.42	1183.82	1136.93	1127.78	1082.31	1141.15
38	1154.59	1126.25	1145.28	1090.47	1082.12	1152.54	1109.61	1104.00	1086.40	1067.69
39	1459.45	1500.13	1461.09	1445.86	1504.96	1504.83	1462.44	1409.70	1432.53	1457.53
40	2102.16	2139.50	2112.45	2104.55	2135.85	2198.15	2109.21	2071.41	2064.42	2082.96
41	1588.94	1595.69	1611.42	1570.59	1557.46	1637.37	1580.88	1554.76	1549.55	1544.09
42	880.94	882.98	885.64	847.26	893.96	900.07	842.61	887.87	869.27	852.87
43	818.34	830.45	801.00	797.50	829.41	847.22	819.14	791.31	787.66	802.76
44	2159.11	2200.04	2159.10	2128.00	2145.14	2226.34	2135.49	2076.37	2093.26	2092.92
45	529.24	528.88	514.76	508.44	523.23	513.09	502.93	461.28	476.98	464.34
46	765.78	792.44	791.37	781.18	770.38	816.94	770.15	763.97	742.15	769.24
47	893.45	866.69	891.02	839.89	860.32	900.55	842.96	853.20	805.35	828.27
48	2053.08	2050.66	2049.47	2038.65	2042.77	2109.58	2012.23	1981.42	1995.29	1989.27
49	1232.71	1263.61	1246.82	1246.14	1259.99	1284.24	1263.81	1231.35	1245.44	1242.01
50	868.67	801.46	860.18	817.80	830.04	902.23	818.98	830.58	754.53	841.83
	TT101	TT102	TT103	TT104	TT105	TT106	TT107	TT108	TT109	TT110
1	1053.72	1038.01	1044.77	1010.82	1071.96	1024.70	1077.59	994.51	1061.16	1037.23
2	682.60	700.95	723.23	705.23	726.36	684.98	718.80	689.57	736.07	687.30
3	1474.99	1479.39	1518.45	1494.32	1494.81	1473.16	1568.59	1463.65	1511.55	1425.90
4	2126.93	2202.70	2255.44	2159.96	2241.19	2205.99	2284.22	2185.63	2216.50	2153.80
5	1710.38	1757.18	1799.22	1752.37	1782.30	1765.29	1841.26	1759.54	1795.07	1717.99
6	716.16	686.56	713.21	698.12	708.27	695.90	762.75	674.14	742.20	686.86
7	530.08	507.33	535.25	521.32	569.27	542.23	559.17	516.30	527.98	521.44
8	2021.91	2069.31	2096.64	2016.69	2083.93	2071.97	2131.05	2014.48	2075.74	2057.54
9	1671.19	1682.02	1750.89	1654.18	1717.77	1671.08	1761.09	1648.18	1662.44	1674.47
10	1344.20	1406.78	1436.65	1418.63	1452.36	1431.29	1479.10	1422.08	1421.80	1380.95
11	171.90	160.74	171.24	167.44	200.09	167.35	167.74	167.77	187.91	165.06

12	1455.42	1467.23	1472.72	1431.56	1509.46	1468.47	1484.92	1456.21	1458.21	1436.81
13	2084.68	2157.43	2186.46	2111.31	2160.29	2152.90	2229.17	2121.73	2145.79	2113.78
14	1795.13	1859.27	1905.00	1838.15	1906.58	1833.61	1918.69	1819.76	1872.85	1806.11
15	1697.00	1762.77	1830.67	1749.96	1795.14	1749.92	1843.54	1730.95	1760.49	1734.73
16	748.64	834.69	821.73	787.54	806.31	844.20	840.98	814.45	808.19	805.32
17	2067.93	2123.33	2183.79	2104.59	2170.51	2140.17	2237.01	2137.05	2156.33	2115.22
18	678.85	694.68	730.78	691.53	732.95	739.22	744.45	720.35	722.61	670.41
19	43.51	44.05	53.09	35.97	53.92	46.35	49.00	38.34	42.64	43.89
20	934.26	956.29	971.86	914.94	947.81	942.08	908.40	879.34	929.19	928.70
21	1261.45	1308.93	1331.80	1275.30	1345.74	1332.80	1355.01	1298.78	1311.35	1311.24
22	1203.89	1275.43	1274.26	1265.95	1290.98	1255.84	1330.54	1264.59	1272.56	1230.22
23	393.56	427.22	412.84	427.68	434.65	426.13	445.57	417.38	380.94	398.17
24	2181.37	2255.18	2306.83	2212.76	2295.34	2259.65	2337.38	2240.42	2268.91	2207.06
25	184.75	190.02	161.33	156.55	150.56	176.23	187.56	144.06	171.75	172.49
26	569.49	578.14	585.79	546.22	575.25	569.44	590.71	555.24	592.01	575.55
27	410.41	459.77	459.98	447.50	472.55	447.17	471.79	497.29	497.14	408.69
28	1021.24	1073.00	1112.75	1033.33	1084.98	1048.62	1085.48	1067.21	1077.35	1056.46
29	1496.10	1489.81	1549.43	1481.52	1538.94	1515.99	1566.89	1492.13	1497.48	1509.99
30	1097.30	1075.47	1067.00	1053.46	1110.75	1088.60	1117.09	1088.47	1090.27	1091.38
31	182.94	203.29	213.44	188.43	200.57	214.53	225.83	196.67	176.34	192.47
32	1975.64	2040.86	2081.97	2012.84	2085.90	2055.22	2122.99	2038.79	2047.83	2030.71
33	918.60	938.60	969.73	943.43	962.83	932.68	1008.95	982.73	955.04	915.58
34	2152.69	2178.51	2220.03	2154.27	2224.93	2193.54	2265.33	2157.96	2202.53	2149.21
35	1076.34	1150.51	1149.80	1135.16	1181.86	1144.03	1199.12	1158.26	1160.07	1099.94
36	311.57	305.42	306.09	284.29	327.79	307.49	301.00	286.95	307.62	306.84
37	1121.39	1128.51	1122.28	1091.41	1149.66	1124.11	1139.57	1116.22	1154.88	1107.33
38	1095.26	1117.71	1144.25	1101.67	1143.44	1146.24	1206.98	1109.44	1181.47	1117.28
39	1436.09	1500.36	1504.54	1498.75	1479.92	1472.94	1566.33	1426.29	1439.88	1431.89
40	2071.51	2130.91	2184.28	2090.06	2187.34	2128.72	2212.56	2115.38	2130.94	2088.55
41	1576.25	1586.79	1636.11	1572.78	1609.03	1583.76	1648.85	1588.93	1656.99	1559.72
42	885.62	863.15	893.71	886.73	877.67	894.49	922.23	865.07	884.83	918.48
43	790.36	812.16	799.45	797.90	823.08	815.95	811.08	778.48	809.78	793.58
44	2114.27	2158.54	2206.32	2116.91	2186.02	2170.61	2266.24	2154.97	2178.96	2110.58
45	454.05	529.17	547.97	497.01	512.94	518.61	546.14	490.13	476.31	498.09
46	752.35	809.75	760.48	785.94	797.60	797.76	814.97	804.07	802.85	772.93
47	814.75	883.19	875.66	855.84	876.21	885.47	917.93	873.29	892.71	868.95
48	2003.43	2047.68	2091.47	2022.14	2077.23	2060.13	2155.83	2033.50	2060.47	2013.97
49	1273.28	1228.99	1297.25	1243.55	1270.72	1232.91	1294.38	1211.59	1269.65	1237.61
50	815.59	896.34	842.70	829.23	854.93	857.72	893.44	847.87	876.60	829.65
	TT101	TT102	TT103	TT104	TT105	TT106	TT107	TT108	TT109	TT110
1	1053.72	1038.01	1044.77	1010.82	1071.96	1024.70	1077.59	994.51	1061.16	1037.23
2	682.60	700.95	723.23	705.23	726.36	684.98	718.80	689.57	736.07	687.30
3	1474.99	1479.39	1518.45	1494.32	1494.81	1473.16	1568.59	1463.65	1511.55	1425.90
4	2126.93	2202.70	2255.44	2159.96	2241.19	2205.99	2284.22	2185.63	2216.50	2153.80
5	1710.38	1757.18	1799.22	1752.37	1782.30	1765.29	1841.26	1759.54	1795.07	1717.99
6	716.16	686.56	713.21	698.12	708.27	695.90	762.75	674.14	742.20	686.86
7	530.08	507.33	535.25	521.32	569.27	542.23	559.17	516.30	527.98	521.44
8	2021.91	2069.31	2096.64	2016.69	2083.93	2071.97	2131.05	2014.48	2075.74	2057.54
9	1671.19	1682.02	1750.89	1654.18	1717.77	1671.08	1761.09	1648.18	1662.44	1674.47
10	1344.20	1406.78	1436.65	1418.63	1452.36	1431.29	1479.10	1422.08	1421.80	1380.95
11	171.90	160.74	171.24	167.44	200.09	167.35	167.74	167.77	187.91	165.06
12	1455.42	1467.23	1472.72	1431.56	1509.46	1468.47	1484.92	1456.21	1458.21	1436.81
13	2084.68	2157.43	2186.46	2111.31	2160.29	2152.90	2229.17	2121.73	2145.79	2113.78
14	1795.13	1859.27	1905.00	1838.15	1906.58	1833.61	1918.69	1819.76	1872.85	1806.11
15	1697.00	1762.77	1830.67	1749.96	1795.14	1749.92	1843.54	1730.95	1760.49	1734.73
16	748.64	834.69	821.73	787.54	806.31	844.20	840.98	814.45	808.19	805.32
17	2067.93	2123.33	2183.79	2104.59	2170.51	2140.17	2237.01	2137.05	2156.33	2115.22
18	678.85	694.68	730.78	691.53	732.95	739.22	744.45	720.35	722.61	670.41
19	43.51	44.05	53.09	35.97	53.92	46.35	49.00	38.34	42.64	43.89
20	934.26	956.29	971.86	914.94	947.81	942.08	908.40	879.34	929.19	928.70
21	1261.45	1308.93	1331.80	1275.30	1345.74	1332.80	1355.01	1298.78	1311.35	1311.24
22	1203.89	1275.43	1274.26	1265.95	1290.98	1255.84	1330.54	1264.59	1272.56	1230.22
23	393.56	427.22	412.84	427.68	434.65	426.13	445.57	417.38	380.94	398.17
24	2181.37	2255.18	2306.83	2212.76	2295.34	2259.65	2337.38	2240.42	2268.91	2207.06
25	184.75	190.02	161.33	156.55	150.56	176.23	187.56	144.06	171.75	172.49
26	569.49	578.14	585.79	546.22	575.25	569.44	590.71	555.24	592.01	575.55

27	410.41	459.77	459.98	447.50	472.55	447.17	471.79	497.29	497.14	408.69
28	1021.24	1073.00	1112.75	1033.33	1084.98	1048.62	1085.48	1067.21	1077.35	1056.46
29	1496.10	1489.81	1549.43	1481.52	1538.94	1515.99	1566.89	1492.13	1497.48	1509.99
30	1097.30	1075.47	1067.00	1053.46	1110.75	1088.60	1117.09	1088.47	1090.27	1091.38
31	182.94	203.29	213.44	188.43	200.57	214.53	225.83	196.67	176.34	192.47
32	1975.64	2040.86	2081.97	2012.84	2085.90	2055.22	2122.99	2038.79	2047.83	2030.71
33	918.60	938.60	969.73	943.43	962.83	932.68	1008.95	982.73	955.04	915.58
34	2152.69	2178.51	2220.03	2154.27	2224.93	2193.54	2265.33	2157.96	2202.53	2149.21
35	1076.34	1150.51	1149.80	1135.16	1181.86	1144.03	1199.12	1158.26	1160.07	1099.94
36	311.57	305.42	306.09	284.29	327.79	307.49	301.00	286.95	307.62	306.84
37	1121.39	1128.51	1122.28	1091.41	1149.66	1124.11	1139.57	1116.22	1154.88	1107.33
38	1095.26	1117.71	1144.25	1101.67	1143.44	1146.24	1206.98	1109.44	1181.47	1117.28
39	1436.09	1500.36	1504.54	1498.75	1479.92	1472.94	1566.33	1426.29	1439.88	1431.89
40	2071.51	2130.91	2184.28	2090.06	2187.34	2128.72	2212.56	2115.38	2130.94	2088.55
41	1576.25	1586.79	1636.11	1572.78	1609.03	1583.76	1648.85	1588.93	1656.99	1559.72
42	885.62	863.15	893.71	886.73	877.67	894.49	922.23	865.07	884.83	918.48
43	790.36	812.16	799.45	797.90	823.08	815.95	811.08	778.48	809.78	793.58
44	2114.27	2158.54	2206.32	2116.91	2186.02	2170.61	2266.24	2154.97	2178.96	2110.58
45	454.05	529.17	547.97	497.01	512.94	518.61	546.14	490.13	476.31	498.09
46	752.35	809.75	760.48	785.94	797.60	797.76	814.97	804.07	802.85	772.93
47	814.75	883.19	875.66	855.84	876.21	885.47	917.93	873.29	892.71	868.95
48	2003.43	2047.68	2091.47	2022.14	2077.23	2060.13	2155.83	2033.50	2060.47	2013.97
49	1273.28	1228.99	1297.25	1243.55	1270.72	1232.91	1294.38	1211.59	1269.65	1237.61
50	815.59	896.34	842.70	829.23	854.93	857.72	893.44	847.87	876.60	829.65
	TT111	TT112	TT113	TT114	TT115	TT116	TT117	TT118	TT119	TT120
1	998.84	1020.43	1060.79	1040.60	1046.88	1078.67	1080.45	1025.21	996.59	1001.39
2	702.11	713.40	719.65	671.94	681.76	705.04	724.13	726.85	680.05	709.62
3	1437.83	1468.74	1510.22	1465.89	1474.25	1522.02	1511.07	1430.83	1474.44	1511.44
4	2180.88	2142.41	2282.66	2162.18	2192.36	2182.57	2255.92	2150.27	2181.67	2198.97
5	1741.75	1742.17	1815.13	1719.50	1775.27	1756.55	1834.92	1727.60	1773.55	1779.47
6	669.93	699.61	702.88	701.59	708.47	698.14	727.99	714.17	693.20	712.33
7	546.15	496.83	517.36	550.20	539.45	526.73	537.71	501.32	553.08	565.31
8	2080.37	2035.40	2129.36	2024.25	2069.30	2069.54	2116.35	2033.28	2059.98	2023.82
9	1670.54	1638.95	1749.95	1686.75	1688.09	1671.75	1750.32	1626.62	1683.59	1653.79
10	1397.26	1363.46	1481.73	1373.00	1416.64	1433.44	1455.42	1340.78	1455.59	1449.18
11	152.48	164.24	175.85	161.96	161.57	188.07	169.30	167.24	144.87	163.89
12	1447.53	1415.72	1532.45	1469.70	1502.90	1419.21	1505.46	1435.66	1463.48	1471.78
13	2119.13	2094.31	2215.54	2110.89	2151.26	2137.47	2169.42	2075.29	2140.03	2127.63
14	1843.66	1791.75	1867.66	1868.78	1839.96	1873.44	1909.00	1819.95	1829.09	1837.93
15	1747.58	1722.43	1820.34	1722.34	1763.05	1729.61	1830.12	1716.35	1797.85	1785.88
16	819.18	774.13	866.49	786.55	781.27	814.79	836.10	782.26	827.73	827.00
17	2095.53	2089.67	2199.60	2102.85	2126.75	2122.24	2200.88	2067.66	2139.50	2135.88
18	714.11	685.22	754.39	703.21	716.43	678.02	755.55	694.14	753.16	765.63
19	46.69	38.32	46.89	40.15	45.26	47.61	46.31	49.33	49.02	42.40
20	934.33	912.61	968.86	948.58	915.57	940.85	918.72	930.60	908.72	925.58
21	1315.65	1271.54	1344.34	1295.98	1339.20	1316.17	1356.24	1283.92	1360.44	1336.16
22	1229.33	1211.49	1291.47	1280.36	1271.90	1317.00	1299.67	1207.45	1246.54	1260.72
23	399.12	381.16	452.19	385.81	437.94	379.44	419.10	372.22	459.00	462.57
24	2233.01	2194.62	2335.31	2215.83	2247.41	2236.36	2307.85	2203.07	2234.11	2251.68
25	167.20	186.82	183.30	187.13	144.96	188.97	158.24	167.21	164.79	152.32
26	585.15	595.22	565.74	561.09	548.88	575.40	590.31	585.45	559.19	566.41
27	432.63	449.77	461.15	437.93	488.03	447.66	461.22	456.41	462.99	458.09
28	1053.42	1011.68	1090.79	1056.00	1074.75	1055.33	1103.79	1052.23	1015.20	1065.24
29	1487.80	1484.41	1541.82	1510.71	1501.34	1526.53	1579.95	1443.42	1509.30	1529.34
30	1065.59	1080.35	1112.54	1072.38	1090.61	1117.27	1147.43	1094.71	1054.15	1030.95
31	223.11	174.39	221.17	186.98	207.95	182.20	204.14	182.15	224.66	196.28
32	2013.47	1985.66	2107.41	2007.69	2021.14	2038.49	2100.65	1965.83	2048.20	2074.80
33	886.21	941.59	973.35	904.68	1001.59	920.68	988.63	913.33	967.30	945.93
34	2176.65	2134.66	2261.51	2141.49	2194.38	2184.32	2260.93	2128.71	2176.94	2186.35
35	1098.73	1092.79	1173.24	1128.17	1120.55	1158.08	1176.64	1106.53	1099.69	1147.46
36	299.10	303.39	318.55	327.05	314.96	335.81	321.76	297.27	277.99	285.41
37	1134.55	1107.31	1165.19	1154.21	1095.13	1128.02	1174.37	1142.25	1060.34	1104.03
38	1102.00	1096.28	1160.70	1111.62	1167.43	1152.36	1167.02	1098.49	1136.20	1104.89
39	1497.71	1441.16	1522.99	1445.59	1440.22	1481.55	1499.86	1436.69	1494.97	1478.19
40	2101.11	2065.56	2210.50	2094.63	2116.74	2115.76	2190.00	2094.16	2100.32	2137.51
41	1523.74	1595.39	1643.38	1563.11	1625.53	1583.52	1624.51	1574.46	1565.96	1572.96

42	873.08	883.36	891.53	861.26	864.92	895.04	925.34	875.19	888.00	876.45
43	843.41	789.25	845.70	810.48	773.47	794.21	820.05	806.06	800.48	806.91
44	2118.90	2111.37	2244.11	2141.37	2151.14	2145.37	2223.20	2108.33	2157.90	2160.42
45	515.56	477.25	548.35	497.20	511.34	496.75	487.86	471.54	558.79	512.50
46	758.50	766.93	805.36	768.20	772.76	814.49	790.24	751.68	762.61	797.48
47	848.04	830.86	910.19	832.07	880.95	870.93	899.25	837.06	883.54	897.60
48	2016.69	2012.11	2125.02	1993.29	2032.23	2038.13	2105.71	2000.33	2082.70	2075.23
49	1225.14	1273.19	1303.44	1227.93	1239.09	1247.83	1323.22	1275.79	1215.21	1202.02
50	805.07	844.20	882.51	835.74	851.76	828.20	852.36	831.85	831.37	858.58
	TT121	TT122	TT123	TT124	TT125	TT126	TT127	TT128	TT129	TT130
1	1020.46	1073.70	1035.37	1026.29	1063.44	1035.65	1019.70	1016.48	1061.82	1076.69
2	721.19	752.13	732.85	708.35	720.63	705.58	695.87	699.84	682.28	744.01
3	1452.71	1512.99	1506.54	1472.20	1465.15	1489.94	1460.19	1429.38	1501.52	1538.66
4	2158.21	2227.99	2179.32	2133.02	2215.91	2197.19	2143.51	2141.37	2222.64	2277.80
5	1736.60	1775.80	1764.73	1737.54	1786.77	1779.47	1721.32	1726.96	1776.27	1867.94
6	679.66	741.10	680.77	727.72	669.53	708.85	687.68	661.40	724.09	722.69
7	545.09	538.34	532.59	550.13	536.65	524.58	551.57	496.97	519.12	551.87
8	2050.30	2083.73	2026.80	2018.66	2097.56	2060.58	2013.57	1985.86	2070.41	2165.25
9	1651.35	1731.58	1701.32	1675.17	1692.54	1691.11	1636.07	1645.86	1695.86	1721.07
10	1417.51	1412.29	1381.72	1365.85	1389.76	1368.63	1355.91	1312.07	1439.24	1440.00
11	183.11	175.42	156.23	163.77	174.69	143.03	148.40	161.24	172.27	162.92
12	1423.39	1470.22	1468.03	1421.72	1466.54	1465.26	1440.29	1405.88	1493.22	1507.59
13	2116.74	2147.36	2102.56	2113.19	2148.63	2133.57	2095.05	2051.11	2165.22	2222.46
14	1801.48	1893.03	1874.88	1855.84	1822.94	1851.37	1816.72	1822.96	1880.30	1931.80
15	1736.97	1774.29	1749.09	1773.14	1755.95	1765.29	1736.92	1704.37	1758.86	1835.92
16	785.40	830.69	817.29	745.60	829.39	805.23	800.90	809.20	826.47	824.23
17	2097.94	2144.92	2108.74	2078.89	2132.44	2120.38	2065.22	2068.21	2139.89	2201.36
18	740.52	715.85	719.53	642.58	706.49	706.41	701.48	691.99	706.14	762.04
19	46.03	41.22	39.71	48.70	45.00	44.78	48.64	47.38	46.40	50.00
20	904.59	945.25	913.26	934.82	979.28	1003.21	907.92	917.42	973.47	950.82
21	1349.34	1291.36	1286.63	1268.02	1295.82	1276.40	1289.18	1230.05	1301.58	1377.18
22	1244.63	1261.82	1275.12	1243.48	1221.97	1258.88	1238.27	1242.30	1287.60	1352.15
23	410.84	382.15	387.10	403.59	406.76	402.12	420.29	375.95	432.04	426.61
24	2212.39	2281.37	2233.31	2186.63	2268.12	2251.12	2195.16	2195.17	2276.24	2331.90
25	163.14	183.26	171.20	164.87	177.19	172.33	178.62	151.43	194.56	188.05
26	581.07	600.80	603.67	583.27	603.25	587.68	576.88	582.29	577.59	633.56
27	458.64	441.33	468.28	435.98	444.17	454.13	456.78	451.95	449.20	495.68
28	1052.66	1076.67	1053.98	1050.14	1094.07	1063.07	1030.77	1037.49	1062.11	1086.28
29	1503.17	1519.39	1508.39	1505.80	1513.12	1515.74	1453.38	1454.39	1508.91	1565.33
30	1061.62	1120.27	1047.71	1080.11	1076.69	1071.56	1039.18	1071.26	1154.28	1157.38
31	199.40	194.69	192.64	197.64	227.86	199.14	213.46	184.94	194.23	177.87
32	2011.46	2053.60	2012.31	1988.64	2059.57	2007.43	1996.34	1958.64	2060.45	2106.71
33	922.14	925.17	928.14	934.44	939.26	941.87	906.03	900.77	957.50	939.90
34	2147.78	2210.84	2154.47	2147.25	2216.21	2186.05	2147.50	2119.50	2221.42	2287.65
35	1140.83	1157.93	1143.71	1109.35	1109.84	1100.08	1129.38	1118.13	1162.84	1202.37
36	302.03	298.44	309.40	300.10	301.29	299.65	281.62	267.07	308.65	325.51
37	1112.08	1181.74	1155.04	1109.94	1166.71	1140.10	1110.66	1108.96	1160.84	1221.08
38	1091.11	1150.84	1081.36	1097.33	1096.95	1115.14	1102.82	1076.03	1150.48	1186.84
39	1440.40	1509.41	1486.34	1469.76	1495.38	1486.53	1453.75	1421.16	1517.46	1515.58
40	2088.68	2166.23	2114.80	2087.74	2158.40	2139.27	2079.06	2070.52	2157.53	2193.48
41	1551.63	1585.04	1546.19	1532.79	1584.43	1607.77	1531.53	1552.81	1624.73	1671.71
42	884.86	922.82	848.14	871.94	846.34	871.00	860.06	855.61	885.74	928.39
43	815.78	829.11	833.07	779.34	799.43	794.96	792.43	771.17	808.78	892.76
44	2117.30	2175.75	2133.08	2100.28	2152.29	2149.85	2106.26	2091.25	2200.25	2228.18
45	496.67	495.74	504.45	455.40	518.68	487.53	485.70	463.71	505.44	483.89
46	793.87	784.02	763.83	791.76	767.63	759.19	790.76	753.32	798.55	822.31
47	844.00	876.92	838.45	833.22	851.36	858.61	850.89	797.01	870.39	893.73
48	2019.74	2082.19	2028.34	2008.30	2060.71	2044.03	2021.03	1975.71	2084.31	2101.93
49	1218.85	1307.41	1252.72	1238.01	1261.40	1284.02	1210.07	1263.78	1281.36	1333.91
50	812.54	829.90	817.15	789.32	859.51	839.25	830.68	805.97	879.75	915.37
	TT131	TT132	TT133	TT134	TT135	TT136	TT137	TT138	TT139	TT140
1	943.15	1024.96	1016.36	1083.44	966.41	1003.62	1103.52	1045.01	1054.44	1023.96
2	693.64	701.70	711.03	736.04	673.74	722.70	746.82	708.43	703.46	699.34
3	1418.82	1438.30	1491.12	1515.39	1444.14	1474.74	1547.29	1486.05	1501.57	1428.39
4	2113.92	2176.16	2177.41	2222.50	2129.19	2187.56	2314.28	2187.20	2218.95	2138.45
5	1700.86	1771.69	1741.70	1804.97	1674.59	1775.71	1857.72	1786.89	1787.99	1687.00

6	647.99	684.17	721.34	725.09	685.06	710.42	748.08	672.07	727.14	670.25
7	517.28	547.08	556.02	544.27	506.80	534.19	556.23	523.70	509.37	527.90
8	1945.49	2064.42	2036.95	2110.93	1982.37	2068.99	2161.75	2037.19	2066.66	2017.95
9	1606.36	1643.89	1678.32	1702.06	1634.49	1649.40	1748.73	1679.48	1723.19	1630.33
10	1357.70	1427.60	1404.12	1418.62	1413.12	1455.74	1483.17	1422.46	1426.31	1353.23
11	144.18	177.23	173.34	182.29	167.62	172.60	183.19	175.33	166.56	172.05
12	1390.67	1468.53	1431.24	1441.97	1441.03	1449.32	1533.73	1451.99	1505.61	1425.52
13	2050.70	2122.31	2125.00	2156.10	2076.93	2137.04	2220.83	2126.84	2167.73	2082.98
14	1791.12	1817.09	1849.86	1867.15	1815.88	1827.35	1904.91	1830.19	1901.14	1809.07
15	1716.60	1758.72	1752.88	1776.09	1712.00	1763.08	1839.54	1744.01	1788.73	1713.05
16	788.90	790.08	786.33	805.21	783.62	808.82	839.17	836.02	805.10	774.94
17	2066.00	2112.88	2102.28	2145.99	2053.87	2117.71	2232.27	2131.74	2141.10	2059.02
18	668.31	702.99	701.02	725.05	686.69	742.46	764.02	743.05	712.78	659.43
19	48.72	45.96	42.24	42.39	49.77	38.55	44.90	37.20	49.08	48.45
20	904.01	953.93	928.41	990.23	907.09	916.88	952.45	905.79	967.97	912.73
21	1245.44	1343.69	1293.18	1302.81	1288.47	1338.32	1390.21	1286.80	1306.57	1268.15
22	1210.76	1228.60	1249.63	1263.83	1223.46	1234.07	1327.85	1254.81	1286.13	1212.94
23	399.97	429.56	400.29	378.41	411.39	448.40	433.60	424.58	445.62	381.50
24	2165.50	2228.95	2230.43	2275.60	2183.07	2241.26	2367.94	2240.38	2273.62	2191.13
25	133.14	164.97	152.07	195.45	149.73	170.50	164.31	163.52	176.79	161.23
26	559.04	597.07	588.87	595.67	532.14	575.34	608.47	578.42	576.26	582.99
27	450.12	446.16	441.35	453.20	440.66	464.99	478.47	461.83	491.35	447.42
28	1040.80	1053.79	1071.59	1069.49	1058.57	1030.88	1092.13	1080.38	1074.79	1055.47
29	1449.70	1511.58	1520.64	1529.97	1446.89	1494.81	1588.53	1515.38	1487.20	1456.49
30	1011.73	1090.52	1073.60	1116.45	1067.57	1103.13	1153.95	1096.80	1117.92	1042.45
31	190.23	201.75	199.36	205.46	181.59	210.92	199.52	202.97	204.63	203.35
32	1996.46	2040.85	2015.51	2041.86	1983.93	2019.62	2131.71	2068.21	2030.12	1977.00
33	903.63	934.84	956.32	941.52	906.52	966.88	1003.73	963.99	971.90	927.09
34	2084.32	2182.48	2142.85	2229.80	2111.45	2189.73	2310.55	2205.55	2209.77	2125.47
35	1128.17	1084.15	1118.97	1142.24	1124.74	1128.12	1189.47	1181.58	1154.95	1110.69
36	279.13	309.68	298.51	326.37	308.73	304.18	306.10	325.43	298.01	307.21
37	1069.74	1095.64	1084.89	1187.74	1068.61	1100.58	1178.54	1146.27	1136.02	1110.38
38	1082.78	1109.53	1116.18	1140.49	1124.90	1153.28	1186.18	1113.21	1146.40	1082.88
39	1392.34	1442.77	1471.24	1492.97	1420.90	1498.96	1521.19	1468.91	1514.56	1421.17
40	2042.56	2108.29	2124.99	2154.51	2077.97	2112.64	2232.25	2114.77	2159.58	2077.86
41	1537.88	1590.39	1569.79	1628.70	1562.60	1610.46	1687.00	1577.22	1620.33	1548.97
42	854.72	857.76	887.97	878.31	871.07	894.45	915.60	874.82	859.40	808.14
43	758.74	792.06	771.76	832.26	768.69	819.73	830.13	829.72	811.34	776.31
44	2049.73	2137.42	2138.83	2189.97	2102.24	2151.14	2257.37	2155.63	2192.74	2094.52
45	472.84	499.94	511.20	494.81	472.71	512.34	507.41	519.99	504.89	466.28
46	759.96	787.90	767.37	780.40	785.52	821.56	803.77	790.07	794.93	773.23
47	848.33	842.43	852.52	860.14	867.52	895.36	889.49	889.00	873.63	811.06
48	1955.92	2039.37	2021.57	2088.47	1967.21	2070.43	2163.23	2074.17	2076.21	1982.19
49	1184.66	1197.01	1237.39	1306.34	1213.21	1224.37	1329.14	1253.81	1282.64	1196.52
50	818.95	865.41	814.11	834.25	820.24	844.51	890.36	839.51	881.49	827.74
	TT141	TT142	TT143	TT144	TT145	TT146	TT147	TT148	TT149	TT150
1	1056.74	1095.62	985.91	1008.84	1077.83	1013.21	1025.53	972.32	1038.06	1028.98
2	718.12	735.44	697.54	700.49	737.18	683.39	709.95	717.68	739.02	712.78
3	1505.77	1534.89	1481.68	1465.52	1561.89	1447.29	1455.44	1454.82	1456.11	1465.43
4	2249.95	2300.66	2179.16	2149.86	2261.16	2152.47	2173.17	2167.32	2154.34	2196.66
5	1758.76	1861.75	1718.41	1740.59	1837.79	1759.09	1715.39	1756.60	1741.83	1748.06
6	694.54	729.70	699.20	701.02	727.50	715.72	679.50	654.19	717.40	698.05
7	526.50	533.29	515.51	526.23	531.24	513.34	513.30	563.25	538.45	531.78
8	2102.15	2150.80	2016.10	2013.60	2099.64	2038.34	2003.20	2040.96	2053.14	2057.21
9	1686.97	1756.87	1647.04	1638.74	1723.77	1625.13	1648.81	1628.35	1697.97	1687.96
10	1462.26	1497.04	1406.42	1388.79	1474.88	1398.33	1364.30	1429.30	1399.23	1435.54
11	186.68	199.75	160.01	173.33	184.44	160.40	174.47	158.35	179.89	166.62
12	1504.11	1518.08	1424.18	1434.80	1446.12	1466.41	1462.69	1430.77	1435.38	1466.79
13	2153.77	2219.41	2118.05	2102.31	2199.75	2111.86	2085.02	2115.96	2112.42	2146.06
14	1870.69	1929.54	1834.66	1821.24	1916.15	1837.64	1849.90	1800.12	1848.73	1855.65
15	1743.68	1837.41	1729.77	1724.97	1800.93	1736.24	1706.96	1728.56	1770.35	1792.68
16	846.68	846.86	840.88	798.07	835.96	795.81	790.78	836.34	756.37	812.99
17	2150.08	2236.06	2076.93	2098.85	2206.01	2070.57	2098.30	2098.62	2104.93	2133.03
18	734.48	760.79	704.87	680.25	699.30	703.63	693.52	748.03	686.09	708.25
19	45.00	44.72	35.05	47.32	36.23	35.72	45.32	41.21	46.65	47.71
20	960.92	940.71	922.97	933.68	968.11	952.96	925.34	910.77	919.58	928.81

21	1335.43	1379.97	1278.62	1303.27	1308.82	1289.01	1270.30	1322.21	1309.12	1308.21
22	1268.71	1355.59	1263.42	1288.65	1352.02	1211.99	1245.70	1235.77	1240.45	1253.29
23	403.21	430.37	391.99	414.67	415.29	418.95	392.75	420.44	401.32	421.02
24	2303.05	2353.09	2232.10	2203.58	2312.93	2205.66	2225.43	2221.11	2205.38	2247.70
25	188.07	154.72	148.75	166.97	191.17	178.94	172.82	156.15	169.52	173.36
26	587.99	576.43	571.46	575.68	602.87	571.40	580.53	575.38	585.73	586.07
27	451.47	491.80	458.48	446.35	486.64	461.22	460.47	451.23	422.34	432.97
28	1067.06	1105.62	1081.69	1068.57	1082.36	1062.35	1040.75	1056.72	1071.05	1037.55
29	1506.29	1576.29	1485.53	1475.75	1533.55	1464.64	1477.83	1488.05	1516.61	1544.64
30	1131.37	1154.25	1081.60	1050.26	1087.31	1094.85	1078.93	1061.45	1079.62	1127.16
31	182.67	189.30	190.20	188.34	201.80	202.74	180.26	211.77	205.72	196.20
32	2085.64	2133.92	2005.55	2019.68	2126.93	2003.30	2019.87	2044.54	2019.93	2058.14
33	938.45	1001.66	935.43	878.63	968.48	939.67	905.49	910.50	922.52	956.37
34	2222.90	2280.05	2139.53	2143.07	2246.54	2173.23	2140.16	2150.76	2151.02	2190.80
35	1175.14	1210.11	1138.04	1135.58	1217.51	1091.26	1165.01	1157.09	1143.47	1160.62
36	323.86	318.05	289.16	275.58	301.61	316.51	315.06	294.96	326.71	342.62
37	1162.40	1166.49	1111.11	1120.06	1155.13	1126.44	1149.93	1127.05	1127.25	1149.23
38	1177.01	1183.64	1106.61	1065.83	1165.82	1148.34	1107.90	1094.63	1118.74	1133.96
39	1469.01	1517.05	1472.13	1468.66	1563.35	1465.04	1421.35	1447.39	1484.82	1486.38
40	2168.89	2213.57	2110.90	2093.32	2177.12	2088.71	2103.54	2089.11	2096.69	2148.40
41	1659.56	1663.20	1556.14	1542.76	1644.78	1588.61	1578.63	1541.76	1555.93	1574.76
42	880.53	908.68	841.19	886.45	902.15	851.24	873.72	884.79	883.85	904.19
43	816.17	851.82	800.08	816.42	819.20	796.27	800.42	836.55	807.09	833.41
44	2202.86	2252.91	2142.61	2123.42	2204.54	2131.51	2114.87	2123.04	2122.90	2160.16
45	523.00	547.06	510.81	472.21	554.57	494.67	483.94	512.35	498.65	486.09
46	784.40	796.96	773.76	817.63	817.73	791.86	782.87	797.56	775.95	802.86
47	897.13	913.92	852.83	862.91	920.45	881.97	849.46	884.06	841.48	855.29
48	2086.67	2120.00	2015.69	2002.07	2121.58	2013.98	2002.46	2023.75	2005.22	2061.61
49	1280.73	1318.61	1196.18	1210.51	1286.27	1211.39	1242.63	1190.50	1267.56	1272.69
50	912.70	904.78	836.23	823.40	883.26	863.56	856.00	840.75	817.94	826.09

APPENDIX F

SIoux FALLS NETWORK TRIP ROUTE DATA (27-LINK/45-TRIP)

Link#	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Trip1	0	1	0	0	0	1	0	0	0	0	0	1	0	0
Trip2	1	1	1	0	0	1	0	1	1	0	0	1	0	0
Trip3	0	1	0	0	0	1	0	0	0	0	1	0	0	1
Trip4	0	0	0	0	0	0	1	1	0	0	0	0	0	1
Trip5	0	0	0	1	0	0	0	0	0	1	0	0	0	0
Trip6	0	0	1	1	1	0	1	0	0	0	0	0	1	0
Trip7	0	0	0	0	0	1	0	0	0	0	1	0	0	0
Trip8	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Trip9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trip10	0	0	0	1	1	1	1	1	0	0	1	0	1	1
Trip11	1	1	1	0	1	0	0	0	0	1	0	0	0	0
Trip12	1	0	0	1	0	0	0	0	1	0	0	0	0	1
Trip13	0	0	0	0	0	0	0	0	1	1	0	0	0	0
Trip14	0	0	0	0	1	1	0	0	0	0	0	1	0	0
Trip15	0	0	0	0	0	0	1	1	1	1	0	0	0	0
Trip16	0	0	0	0	1	0	0	0	0	1	0	1	0	0
Trip17	0	0	0	0	0	0	1	1	0	0	0	0	1	1
Trip18	1	1	0	0	1	0	0	0	0	1	0	0	0	0
Trip19	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Trip20	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trip21	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trip22	0	0	1	1	1	0	0	1	0	0	0	0	0	0
Trip23	0	1	0	0	1	0	0	1	1	0	0	0	0	0
Trip24	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Trip25	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trip26	1	0	0	1	1	1	0	0	0	0	1	0	0	0
Trip27	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Trip28	0	0	0	0	0	0	0	0	1	1	0	0	0	0
Trip29	0	0	0	0	1	1	0	0	0	1	0	0	0	0
Trip30	1	0	1	0	0	0	0	1	1	1	1	1	0	0
Trip31	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trip32	0	0	0	0	1	1	1	1	1	0	0	0	1	0
Trip33	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trip34	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trip35	0	0	0	0	0	0	1	1	0	1	0	0	1	1
Trip36	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trip37	0	0	0	0	0	0	0	0	0	0	1	1	1	0
Trip38	0	0	0	1	0	0	0	0	0	1	1	0	0	0
Trip39	1	0	1	0	0	0	1	0	0	0	0	0	1	1
Trip40	1	1	1	0	1	0	1	0	0	1	1	1	0	0
Trip41	1	1	1	0	0	1	0	0	0	0	0	1	0	0
Trip42	0	0	0	0	0	0	0	1	0	0	1	0	0	1
Trip43	0	0	0	1	0	0	0	0	0	1	0	0	0	0
Trip44	0	0	0	0	0	0	1	1	0	1	0	0	0	1
Trip45	0	0	0	0	0	0	0	0	0	0	1	1	1	0
Link#	15	16	17	18	19	20	21	22	23	24	25	26	27	
Trip1	0	0	0	1	0	0	0	0	0	1	0	0	0	
Trip2	0	0	1	0	0	0	0	0	0	0	0	0	0	
Trip3	0	1	0	0	1	0	0	0	1	1	1	0	1	
Trip4	1	1	0	0	0	1	0	1	0	1	0	0	1	
Trip5	1	0	0	0	0	0	1	0	0	0	0	0	1	
Trip6	0	0	0	0	0	0	0	0	0	0	0	1	0	
Trip7	1	0	0	0	0	0	1	0	0	0	1	0	0	
Trip8	0	0	1	0	0	0	0	1	0	0	0	0	0	
Trip9	0	0	0	1	0	0	1	1	1	0	0	0	0	
Trip10	1	0	1	1	0	1	0	1	0	0	1	1	0	
Trip11	0	1	0	0	0	0	0	0	1	0	0	0	0	
Trip12	0	0	0	0	0	1	0	0	0	0	0	0	0	
Trip13	1	0	0	0	0	0	1	0	1	1	0	0	1	

Trip14	0	0	0	1	0	0	0	0	0	1	0	0	0
Trip15	1	0	0	0	0	0	1	0	0	0	0	0	0
Trip16	0	0	1	0	0	0	0	1	0	0	0	0	1
Trip17	0	0	0	0	0	1	1	1	1	0	0	0	0
Trip18	1	0	0	1	0	0	1	0	1	1	0	0	1
Trip19	0	0	0	0	0	0	0	0	1	0	0	0	0
Trip20	0	0	0	0	0	0	0	0	1	0	0	0	0
Trip21	0	0	0	0	0	0	1	0	0	0	0	0	1
Trip22	0	0	0	0	0	0	0	0	0	0	0	0	0
Trip23	0	0	0	0	0	0	0	0	0	0	0	0	0
Trip24	0	1	0	0	0	0	0	0	0	0	0	0	0
Trip25	0	0	0	1	0	1	1	1	1	0	0	0	0
Trip26	0	1	0	0	0	0	0	0	1	0	0	0	0
Trip27	0	0	0	0	0	0	0	0	0	0	0	0	0
Trip28	0	1	1	0	0	0	0	0	0	0	0	0	0
Trip29	0	1	0	0	0	0	0	0	0	0	0	0	0
Trip30	1	1	0	1	0	0	1	1	0	1	1	1	1
Trip31	1	0	0	0	0	1	0	0	0	0	0	0	0
Trip32	0	0	0	0	1	0	0	0	0	0	0	1	0
Trip33	0	0	0	0	1	0	0	0	0	1	1	0	1
Trip34	0	0	0	0	0	1	1	0	0	0	1	1	0
Trip35	0	1	0	0	1	0	0	1	0	0	1	0	0
Trip36	0	0	1	0	0	0	0	1	0	0	1	0	0
Trip37	1	0	0	1	1	1	0	0	0	1	0	1	0
Trip38	1	0	0	0	1	0	0	0	0	0	0	0	0
Trip39	0	0	0	0	1	0	0	0	0	0	0	1	0
Trip40	0	0	1	0	0	0	0	0	0	0	0	0	0
Trip41	0	0	1	0	0	0	0	0	0	0	0	0	0
Trip42	1	0	0	0	0	1	0	0	0	0	0	0	0
Trip43	0	1	0	0	0	0	0	0	1	1	1	1	1
Trip44	1	0	0	0	0	1	0	0	0	0	0	0	0
Trip45	1	0	0	0	0	0	1	1	1	1	1	1	1

APPENDIX G

IOUX FALLS NETWORK TRIP ITINERARY DATA (27-LINK/45-TRIP)

Trip#	TT1	TT2	TT3	TT4	TT5	TT6	TT7	TT8	TT9	TT10
1	219.09	219.14	238.15	232.70	236.60	223.14	240.94	195.37	227.69	231.27
2	309.85	358.06	337.93	352.99	358.28	338.18	370.01	336.77	317.16	340.46
3	423.48	378.50	434.72	423.40	448.08	419.64	403.65	396.23	410.59	394.48
4	389.80	368.42	418.79	394.90	439.09	418.69	391.87	398.14	376.48	369.49
5	203.36	225.40	221.81	189.15	212.26	210.79	205.55	215.93	206.87	202.21
6	240.76	259.84	286.30	250.34	265.81	285.32	256.87	243.68	237.85	230.61
7	212.74	192.74	208.15	194.59	207.10	196.23	194.78	206.52	211.26	190.65
8	134.80	134.30	151.80	147.00	145.62	147.83	132.04	143.26	140.71	137.36
9	178.34	171.06	199.23	169.61	184.14	181.30	172.01	141.35	191.38	165.89
10	657.90	647.20	705.32	641.49	695.26	679.48	652.86	640.84	657.57	602.93
11	267.49	314.40	283.21	288.40	309.55	288.93	308.92	270.02	260.22	283.92
12	202.85	227.56	224.17	174.61	212.04	206.26	216.59	213.08	213.29	201.38
13	290.87	286.27	285.97	282.09	288.78	285.91	284.53	286.58	293.60	289.60
14	207.83	205.60	217.72	207.68	212.52	208.78	229.04	176.06	215.27	214.56
15	246.43	249.43	241.95	237.02	268.02	242.20	244.75	251.74	230.78	222.68
16	240.79	254.80	252.90	251.93	254.58	247.75	247.09	253.98	249.44	249.75
17	351.81	322.76	369.21	327.12	362.15	358.16	319.68	336.46	341.70	292.42
18	427.25	454.93	440.84	407.20	448.32	408.73	452.88	389.52	437.94	423.51
19	102.16	98.62	99.77	96.26	103.27	86.20	88.98	80.81	100.44	93.19
20	58.75	49.54	47.15	45.84	49.29	46.14	41.89	40.56	52.86	43.48
21	72.85	74.39	83.42	71.35	69.18	73.70	72.57	72.70	78.74	76.23
22	133.59	176.46	179.17	151.18	171.62	176.97	178.92	149.48	152.75	157.21
23	139.60	153.62	152.74	146.88	161.60	139.26	158.47	135.63	152.58	151.67
24	67.32	77.13	65.54	81.81	83.17	86.59	74.39	84.41	50.56	71.73
25	236.89	226.51	256.53	225.09	240.41	237.22	230.56	198.18	248.71	221.45
26	285.21	287.98	280.83	245.69	293.24	274.20	280.81	268.76	265.08	255.62
27	42.60	54.62	63.47	29.59	48.39	53.62	41.43	47.63	48.19	42.80
28	150.83	169.35	155.50	182.99	170.57	181.22	165.33	176.71	137.12	169.15
29	137.10	144.29	126.88	143.62	147.83	141.70	144.82	140.67	115.39	138.34
30	624.84	655.31	684.60	661.41	697.34	690.35	688.77	655.29	649.35	646.89
31	113.04	108.18	107.19	108.79	114.28	107.73	113.43	106.47	107.56	104.84
32	324.21	289.02	322.32	317.76	342.56	320.14	313.06	295.62	293.56	269.09
33	179.24	155.10	202.06	177.01	195.46	185.48	170.18	168.40	186.63	169.64
34	177.47	172.06	193.39	161.34	165.99	171.46	159.73	173.74	183.19	167.05
35	367.61	340.26	400.15	371.95	421.90	406.94	346.75	375.04	343.82	311.24
36	136.91	137.97	167.19	143.70	152.14	153.26	123.93	149.75	152.11	139.48
37	419.36	376.50	426.96	425.66	431.83	432.05	430.02	380.40	410.47	377.24
38	220.37	210.08	217.99	204.92	241.15	215.06	218.50	215.09	207.72	187.28
39	286.91	287.66	312.06	299.55	323.17	312.40	309.20	279.98	266.19	248.97
40	375.73	415.61	387.57	393.94	419.51	379.92	417.27	388.73	368.36	375.31
41	245.82	289.07	270.01	281.92	280.56	264.68	293.84	262.32	247.31	271.49
42	216.88	206.25	206.64	211.33	228.62	209.78	227.12	220.60	214.47	194.59
43	336.15	341.49	365.44	322.30	350.24	360.78	317.17	348.56	332.65	331.59
44	272.45	272.89	261.32	260.14	295.79	262.32	272.28	277.33	250.57	237.55
45	475.33	430.82	496.15	455.03	469.46	483.98	436.69	466.51	487.42	435.81
Trip#	TT11	TT12	TT13	TT14	TT15	TT16	TT17	TT18	TT19	TT20
1	1034.07	1035.12	1004.91	1038.88	1041.31	1077.05	1035.89	1008.34	1012.68	987.64
2	738.28	705.01	711.56	677.98	670.75	709.67	716.49	708.62	724.47	699.69
3	1482.18	1526.44	1413.72	1468.70	1474.44	1503.31	1487.38	1473.13	1472.55	1402.43
4	2214.06	2231.62	2153.72	2219.50	2185.42	2255.19	2251.59	2182.51	2226.69	2141.88
5	1776.64	1796.85	1751.15	1766.22	1753.39	1822.38	1799.95	1770.22	1786.67	1750.36
6	695.28	688.91	691.72	694.13	711.02	728.74	737.95	648.06	677.36	675.78
7	538.09	536.92	541.19	537.79	536.95	556.66	533.98	561.77	565.91	507.80
8	2090.13	2075.97	2037.68	2094.58	2043.23	2122.18	2141.20	2032.64	2083.12	2029.47
9	1656.52	1703.84	1612.43	1684.54	1703.81	1733.88	1726.72	1657.47	1692.11	1621.65
10	1431.34	1451.39	1381.27	1429.17	1422.27	1427.57	1485.64	1417.91	1457.38	1378.28
11	169.17	163.61	162.30	174.92	166.27	175.51	175.01	157.27	161.36	164.86
12	1465.19	1492.37	1449.90	1486.89	1488.04	1494.46	1495.02	1459.78	1506.09	1431.64
13	2139.83	2174.37	2097.24	2168.08	2144.09	2179.75	2187.70	2125.36	2152.30	2084.03

14	1845.99	1875.73	1777.02	1859.60	1872.04	1875.26	1878.66	1824.87	1862.55	1799.91
15	1752.64	1807.04	1739.07	1770.64	1790.67	1781.23	1794.20	1743.18	1779.58	1720.58
16	824.85	841.73	775.01	798.78	799.53	853.41	851.04	835.34	805.45	826.81
17	2126.81	2165.57	2096.15	2144.43	2130.49	2168.01	2155.05	2112.65	2138.27	2083.17
18	748.88	752.53	713.81	696.25	682.88	763.22	750.09	765.76	756.63	689.15
19	51.62	46.23	39.97	41.54	44.29	48.17	39.67	35.68	39.20	46.33
20	925.50	920.04	898.63	959.75	953.39	965.86	953.19	901.77	975.92	916.64
21	1351.32	1331.83	1315.45	1312.64	1296.67	1325.84	1371.36	1298.71	1335.31	1298.96
22	1291.02	1312.55	1241.85	1277.43	1272.05	1279.35	1273.94	1261.58	1242.76	1232.44
23	417.28	455.81	431.31	402.66	421.97	429.04	419.74	437.95	433.13	403.33
24	2266.70	2284.04	2206.78	2271.60	2239.54	2308.96	2305.55	2236.78	2279.58	2194.30
25	168.10	160.55	141.58	175.83	172.40	182.39	187.11	161.45	149.18	152.96
26	571.43	568.90	552.73	586.54	574.70	597.78	588.99	616.88	603.82	563.01
27	470.79	474.88	467.62	456.79	448.64	441.34	463.82	465.82	466.31	443.15
28	1080.07	1052.54	1043.93	1087.96	1052.83	1101.02	1084.77	1032.57	1088.54	1084.44
29	1495.18	1557.12	1452.69	1502.76	1529.21	1553.12	1505.15	1522.81	1497.96	1468.71
30	1094.37	1114.13	1041.61	1078.95	1097.88	1155.35	1136.47	1045.84	1062.10	1058.33
31	193.70	185.56	194.63	203.33	191.18	216.64	222.59	209.60	211.76	215.89
32	2041.22	2075.31	1985.40	2051.20	2053.88	2077.98	2055.11	2035.74	2065.66	2003.45
33	926.80	991.86	940.85	951.04	967.39	954.33	954.45	945.74	938.52	901.74
34	2191.85	2215.15	2138.38	2208.23	2189.98	2261.00	2238.43	2164.13	2218.53	2131.64
35	1172.84	1177.38	1121.49	1109.72	1134.66	1152.41	1132.91	1144.39	1143.84	1098.11
36	312.42	306.89	291.17	316.63	327.63	302.45	301.68	289.40	302.85	299.21
37	1163.23	1129.30	1088.37	1119.07	1116.55	1184.84	1122.62	1137.36	1162.07	1085.17
38	1127.87	1137.58	1099.99	1136.14	1099.29	1162.04	1172.74	1067.12	1105.55	1128.17
39	1471.68	1494.17	1420.83	1471.60	1484.99	1524.62	1544.50	1486.40	1484.63	1424.30
40	2131.71	2162.40	2074.25	2146.30	2133.14	2194.04	2175.98	2116.62	2146.09	2079.51
41	1597.34	1622.93	1589.60	1638.44	1574.57	1623.13	1609.97	1534.23	1618.74	1543.69
42	881.79	900.22	890.42	877.09	874.64	914.24	893.53	875.79	865.70	889.65
43	850.94	828.40	817.49	802.11	812.89	822.50	828.33	833.34	858.10	766.71
44	2158.17	2194.24	2095.37	2190.37	2161.25	2219.43	2224.94	2127.12	2167.43	2098.34
45	510.95	506.32	482.92	510.39	501.48	520.76	549.92	501.88	514.92	494.59
Trip#	TT21	TT22	TT23	TT24	TT25	TT26	TT27	TT28	TT29	TT30
1	1032.49	1047.73	1010.45	1013.98	1005.28	1014.56	1024.19	991.38	1061.10	1015.38
2	667.65	692.94	699.19	735.99	724.43	690.75	703.99	687.87	700.14	717.79
3	1458.34	1513.11	1437.94	1511.93	1482.61	1455.90	1402.67	1438.04	1449.90	1446.46
4	2182.16	2241.71	2141.06	2232.84	2220.85	2187.32	2141.65	2104.51	2178.29	2140.88
5	1725.71	1828.92	1703.73	1811.64	1788.07	1750.90	1717.55	1717.24	1770.21	1731.94
6	640.75	684.59	672.17	723.27	686.25	678.11	647.55	700.35	699.33	692.63
7	538.55	563.40	537.89	548.53	545.62	510.74	514.07	541.12	531.95	504.90
8	2030.68	2081.00	2004.04	2079.12	2064.57	2040.32	2037.12	1966.17	2066.54	1996.26
9	1689.83	1718.77	1662.06	1702.87	1672.16	1699.86	1652.22	1615.59	1683.15	1637.75
10	1384.26	1418.00	1363.76	1450.32	1423.74	1415.02	1378.29	1343.33	1387.56	1424.40
11	140.60	150.68	147.17	160.53	171.60	182.44	174.20	151.67	164.85	179.47
12	1473.63	1487.79	1455.54	1492.01	1489.04	1476.02	1453.25	1410.70	1502.36	1455.44
13	2119.63	2193.09	2086.26	2150.69	2129.88	2135.34	2073.19	2051.50	2129.90	2070.40
14	1806.43	1886.87	1813.82	1865.13	1848.27	1843.61	1784.64	1812.24	1824.45	1816.51
15	1718.22	1814.04	1735.12	1782.72	1763.68	1757.75	1704.02	1708.09	1745.15	1750.42
16	814.02	832.87	791.79	855.93	806.15	783.92	810.75	770.11	779.26	790.08
17	2107.19	2181.82	2067.75	2171.88	2133.27	2144.23	2073.77	2045.67	2108.54	2105.53
18	707.38	738.09	690.82	732.56	743.62	693.53	714.32	677.53	688.06	712.32
19	46.57	46.81	44.48	45.73	43.10	48.45	39.55	46.82	41.61	43.66
20	927.95	938.21	889.36	907.20	958.89	982.56	930.37	884.43	938.78	904.86
21	1288.63	1317.44	1269.61	1315.98	1318.18	1296.67	1304.84	1240.98	1312.07	1308.52
22	1250.51	1320.67	1225.52	1273.98	1228.71	1236.43	1185.59	1241.33	1273.69	1270.62
23	421.30	433.36	402.61	424.42	436.00	419.63	397.16	396.69	441.52	429.77
24	2235.69	2295.86	2194.92	2286.79	2275.36	2240.61	2195.86	2157.50	2232.08	2192.47
25	189.33	172.24	146.46	182.31	162.81	177.95	160.34	153.04	172.85	164.48
26	612.73	598.77	574.97	620.10	592.39	566.28	566.89	560.36	573.92	533.04
27	423.75	496.30	444.10	471.49	456.51	422.29	423.02	421.18	429.68	442.19
28	1043.36	1081.61	1046.02	1041.19	1055.24	1042.46	1040.60	1047.61	1092.96	1023.93
29	1510.40	1547.93	1478.58	1527.40	1509.66	1537.11	1484.24	1477.04	1511.07	1476.27
30	1054.55	1054.63	1062.31	1091.79	1095.39	1097.63	1078.12	1074.17	1093.07	1061.21
31	204.88	217.42	205.54	220.51	203.16	197.04	215.08	189.71	207.12	167.96
32	2053.61	2086.60	1982.19	2096.10	2060.28	2062.99	2000.88	1979.06	2028.36	2014.04
33	939.00	988.80	946.65	955.82	946.53	940.59	919.59	890.82	949.71	898.30

34	2173.74	2227.63	2127.39	2224.55	2212.45	2169.15	2140.22	2110.61	2182.41	2120.31
35	1148.06	1186.91	1126.78	1162.83	1122.52	1116.81	1092.29	1148.85	1127.69	1144.59
36	300.69	308.81	305.61	284.28	277.81	306.74	310.72	320.38	325.81	299.61
37	1125.49	1161.40	1115.32	1144.30	1147.69	1124.12	1111.81	1116.98	1133.70	1122.64
38	1097.33	1116.96	1075.23	1129.29	1111.60	1110.61	1085.19	1090.71	1118.90	1091.40
39	1450.74	1509.66	1438.40	1541.39	1499.69	1466.81	1425.72	1436.47	1485.18	1446.48
40	2102.66	2169.01	2081.82	2160.93	2155.12	2127.26	2071.56	2055.71	2128.61	2083.06
41	1582.18	1602.99	1524.04	1574.89	1628.76	1619.23	1535.44	1502.27	1595.29	1561.08
42	868.53	865.39	847.32	906.63	886.34	903.01	842.41	897.49	890.41	889.68
43	758.50	816.59	798.67	829.81	810.19	783.66	799.32	792.90	773.62	818.10
44	2120.23	2192.77	2100.09	2199.55	2162.65	2158.98	2100.95	2069.90	2129.23	2110.60
45	501.22	530.24	471.56	520.63	516.30	518.82	515.63	450.64	490.20	471.79
Trip#	TT31	TT32	TT33	TT34	TT35	TT36	TT37	TT38	TT39	TT40
1	1073.54	1039.20	1027.83	1087.35	994.86	1005.72	1006.32	985.83	1046.38	1017.86
2	700.54	708.09	701.91	716.14	697.31	714.75	687.39	725.32	701.80	691.68
3	1476.15	1466.17	1475.65	1514.97	1463.64	1451.47	1441.32	1479.39	1525.17	1461.71
4	2187.09	2179.98	2149.95	2264.03	2195.04	2212.96	2171.97	2172.62	2244.77	2134.21
5	1753.58	1730.89	1722.32	1856.38	1732.23	1783.63	1734.47	1748.94	1824.09	1723.79
6	709.58	681.71	658.67	707.57	680.68	676.30	681.88	666.90	726.62	683.32
7	512.13	508.31	495.02	548.65	487.40	535.13	543.42	502.04	539.12	510.57
8	2032.03	2040.79	2004.82	2136.30	2034.39	2055.46	2038.26	2028.76	2090.41	2011.62
9	1692.12	1658.79	1661.82	1736.49	1698.50	1636.57	1660.51	1676.56	1711.24	1634.57
10	1388.02	1392.70	1383.16	1424.41	1428.52	1428.76	1409.83	1421.26	1479.03	1364.56
11	177.89	174.00	157.88	179.48	158.79	173.90	177.72	158.55	169.98	153.00
12	1492.11	1451.91	1412.76	1485.10	1478.85	1454.69	1445.90	1437.31	1516.32	1433.38
13	2128.48	2111.23	2085.64	2201.08	2138.06	2146.74	2102.36	2104.66	2182.88	2090.07
14	1850.35	1843.00	1856.72	1893.31	1865.24	1840.68	1802.68	1864.29	1914.02	1811.73
15	1762.00	1747.46	1738.62	1809.73	1776.58	1773.23	1715.51	1759.87	1809.67	1709.44
16	795.83	806.68	835.47	837.22	812.81	814.40	827.44	822.46	834.55	790.45
17	2124.66	2112.02	2095.92	2197.93	2116.15	2131.43	2114.46	2114.37	2186.27	2053.97
18	679.83	693.95	659.76	746.17	697.75	744.78	701.94	726.56	715.61	677.44
19	47.21	49.16	40.53	50.04	47.64	44.73	44.22	44.13	43.79	45.09
20	932.61	910.25	944.07	968.40	920.22	928.30	892.68	900.09	996.17	919.55
21	1254.91	1308.27	1247.13	1335.50	1282.31	1328.12	1324.09	1287.33	1337.01	1275.60
22	1275.97	1269.30	1261.43	1308.13	1247.83	1255.78	1263.39	1243.21	1323.68	1238.25
23	426.51	409.83	387.68	429.73	454.50	435.20	396.51	385.23	456.18	403.96
24	2241.64	2231.20	2203.15	2316.68	2246.88	2266.30	2225.30	2227.03	2297.91	2187.79
25	163.86	166.51	191.26	198.77	161.91	129.77	156.13	153.26	198.01	162.92
26	565.75	560.98	591.16	616.90	540.29	573.14	564.90	580.85	589.09	559.39
27	450.90	435.70	424.05	462.96	454.27	480.33	431.47	468.13	457.87	466.28
28	1036.27	1053.93	1045.56	1082.57	1052.44	1104.44	1064.73	1061.12	1046.72	1065.29
29	1497.88	1516.08	1491.80	1580.27	1490.51	1497.04	1505.63	1495.24	1552.92	1427.49
30	1098.85	1094.24	1046.07	1144.13	1096.97	1066.27	1069.70	1080.73	1107.62	1046.83
31	173.96	184.88	175.75	214.14	201.43	200.19	214.74	189.11	197.85	201.05
32	2034.63	2023.56	2019.25	2111.43	2025.98	2041.78	2048.33	2017.58	2111.06	1978.01
33	981.98	945.18	908.92	982.91	984.02	968.55	911.78	952.79	964.94	922.22
34	2185.01	2141.34	2132.52	2265.90	2159.65	2173.62	2153.45	2152.53	2236.50	2133.38
35	1157.26	1150.45	1110.87	1173.37	1135.10	1154.09	1138.12	1146.65	1164.52	1110.19
36	315.27	301.65	284.24	319.70	288.59	313.98	307.26	300.73	306.69	283.62
37	1125.16	1129.87	1130.41	1171.78	1094.41	1106.95	1109.18	1126.20	1141.12	1101.99
38	1123.77	1116.48	1081.23	1143.09	1137.00	1147.82	1091.34	1119.50	1154.26	1106.08
39	1465.16	1442.33	1494.58	1524.26	1506.81	1436.63	1457.59	1466.49	1564.86	1461.55
40	2126.39	2113.88	2089.10	2195.30	2137.58	2143.58	2096.63	2101.93	2176.43	2066.63
41	1603.67	1587.10	1561.40	1641.53	1592.39	1630.54	1529.23	1586.54	1637.09	1559.79
42	887.54	866.80	827.18	899.75	856.63	888.96	851.12	867.08	886.04	832.42
43	807.94	773.31	776.74	815.19	776.35	802.75	795.04	822.82	809.53	777.92
44	2134.64	2141.10	2111.17	2234.69	2148.95	2141.63	2143.14	2148.26	2217.00	2095.05
45	490.36	471.47	487.84	525.37	520.68	521.66	523.50	494.09	541.77	506.86
Trip#	TT41	TT42	TT43	TT44	TT45	TT46	TT47	TT48	TT49	TT50
1	1053.81	1044.03	1050.59	1032.99	1067.81	1013.49	1026.20	1048.69	1044.57	1076.88
2	723.03	729.55	701.41	737.43	773.06	715.54	714.51	700.10	711.25	722.91
3	1495.86	1516.57	1507.05	1509.49	1504.54	1474.17	1457.39	1484.52	1433.93	1522.98
4	2244.78	2274.01	2220.16	2293.54	2275.59	2187.39	2196.70	2212.16	2213.19	2240.06
5	1788.36	1830.73	1748.27	1857.46	1839.38	1744.90	1767.62	1766.26	1789.87	1774.10
6	711.74	721.51	700.68	696.79	719.85	672.15	697.57	681.98	652.87	733.29
7	552.08	565.79	504.31	521.10	538.52	539.16	544.30	518.37	520.43	548.99

8	2104.74	2124.44	2062.52	2150.45	2109.72	2026.21	2073.79	2068.80	2087.46	2056.67
9	1690.68	1744.66	1703.07	1712.84	1715.96	1654.35	1666.86	1689.46	1668.20	1735.15
10	1447.32	1450.47	1397.09	1497.32	1450.73	1423.27	1415.56	1421.33	1401.93	1443.67
11	183.03	158.81	169.23	177.03	184.71	171.01	166.95	170.30	165.47	190.32
12	1481.88	1526.29	1475.23	1506.78	1490.99	1464.98	1468.31	1462.19	1491.97	1502.71
13	2181.99	2220.60	2160.40	2231.15	2188.05	2125.51	2136.26	2140.92	2137.00	2170.50
14	1866.45	1910.37	1900.39	1892.54	1925.97	1833.56	1837.80	1826.03	1852.61	1921.01
15	1800.48	1839.87	1766.50	1828.03	1833.94	1777.29	1757.56	1733.28	1775.86	1790.23
16	830.67	831.09	850.44	876.06	853.35	793.13	777.17	831.87	830.77	808.73
17	2174.48	2201.65	2133.50	2227.59	2206.35	2123.70	2123.57	2125.14	2132.61	2151.35
18	739.55	737.73	698.30	731.29	760.36	701.78	717.29	732.69	711.34	729.43
19	45.21	48.30	51.11	46.87	44.16	47.50	45.73	40.88	48.80	46.23
20	934.07	970.47	930.81	1006.24	948.69	897.15	913.36	917.06	952.11	908.21
21	1346.70	1342.33	1302.69	1348.25	1329.81	1296.64	1335.08	1304.02	1313.13	1309.54
22	1270.92	1305.05	1284.88	1314.97	1337.74	1267.12	1283.64	1285.11	1266.06	1327.56
23	422.75	437.17	391.38	426.89	410.82	450.05	404.37	415.00	424.93	442.13
24	2298.03	2328.47	2274.29	2346.55	2328.72	2242.16	2249.46	2266.01	2265.32	2292.30
25	167.41	178.50	176.68	173.10	167.83	133.05	164.78	173.28	157.88	168.04
26	592.02	608.55	577.84	585.53	577.77	553.86	568.98	567.17	588.60	575.92
27	460.85	479.09	479.70	481.33	466.45	456.90	474.37	449.83	441.60	470.39
28	1087.21	1081.84	1042.45	1118.35	1116.77	1040.01	1055.39	1071.90	1086.00	1106.86
29	1547.57	1562.95	1501.22	1541.55	1567.47	1504.55	1491.72	1512.00	1515.50	1524.19
30	1119.32	1121.42	1128.09	1081.38	1110.67	1063.55	1108.39	1110.94	1113.56	1107.03
31	202.84	219.32	184.96	218.10	200.42	195.17	203.55	210.45	202.74	189.16
32	2083.74	2103.74	2031.39	2137.22	2110.09	2032.04	2022.31	2034.97	2053.38	2067.11
33	964.99	973.11	982.33	967.69	974.79	982.92	939.11	966.40	955.21	966.47
34	2233.03	2263.01	2175.84	2261.26	2220.19	2160.64	2180.91	2190.87	2198.40	2217.71
35	1164.73	1193.02	1147.59	1182.94	1249.85	1150.43	1162.99	1145.24	1143.81	1231.27
36	312.65	318.58	293.53	325.09	342.03	292.65	319.27	296.57	327.47	324.17
37	1178.85	1171.77	1136.09	1173.77	1219.35	1100.34	1153.12	1130.94	1142.57	1164.10
38	1136.50	1171.84	1155.22	1146.39	1161.83	1093.88	1118.84	1135.83	1129.34	1135.00
39	1485.01	1506.62	1488.67	1547.58	1526.63	1478.49	1460.90	1486.20	1460.14	1512.79
40	2185.52	2207.22	2141.93	2212.32	2209.75	2129.24	2128.47	2138.20	2148.74	2178.40
41	1620.56	1634.32	1609.00	1655.95	1629.52	1594.23	1590.18	1603.64	1614.21	1587.22
42	901.16	922.08	833.96	881.96	902.48	884.68	897.57	860.40	870.05	881.64
43	824.45	852.59	797.35	869.60	857.67	797.63	834.47	779.33	813.58	828.30
44	2205.61	2232.76	2190.32	2240.82	2226.52	2122.95	2152.71	2177.36	2158.03	2186.13
45	479.31	502.07	535.38	559.76	529.00	486.58	499.96	523.77	500.78	509.84
Trip#	TT51	TT52	TT53	TT54	TT55	TT56	TT57	TT58	TT59	TT60
1	1045.76	1079.99	1018.82	1016.58	1034.36	1039.35	1074.88	1047.97	1062.38	1023.40
2	733.84	725.79	717.77	736.04	683.77	677.36	723.03	701.68	694.46	711.58
3	1518.63	1497.49	1501.21	1470.31	1444.36	1493.65	1515.50	1454.38	1522.29	1459.55
4	2228.39	2192.71	2209.91	2183.09	2151.02	2212.14	2255.66	2205.61	2239.83	2188.57
5	1815.44	1787.58	1783.28	1785.18	1751.92	1774.78	1841.84	1771.38	1807.50	1757.90
6	725.75	717.33	711.73	715.68	714.38	730.30	728.85	712.46	735.69	698.79
7	535.38	515.95	539.00	569.33	495.13	556.58	562.55	522.92	520.72	537.10
8	2078.91	2057.62	2068.32	2056.17	2058.03	2067.47	2114.33	2082.34	2087.63	2058.84
9	1674.71	1676.47	1698.22	1672.16	1657.87	1709.65	1718.40	1686.71	1719.33	1644.58
10	1444.27	1373.26	1439.42	1411.58	1394.54	1428.39	1459.23	1432.68	1425.98	1400.66
11	191.24	169.41	164.44	162.16	167.82	154.82	175.19	179.72	160.93	170.05
12	1439.99	1476.62	1476.77	1486.09	1470.49	1482.28	1500.11	1483.00	1486.85	1436.74
13	2153.89	2135.48	2157.56	2113.83	2096.85	2174.98	2175.69	2138.44	2186.31	2131.22
14	1882.94	1839.18	1855.21	1829.93	1805.10	1885.94	1914.78	1839.61	1908.76	1803.38
15	1780.16	1765.72	1775.69	1765.77	1738.03	1773.36	1802.30	1778.15	1800.40	1747.73
16	815.56	798.33	806.25	788.18	797.00	813.21	831.80	834.07	815.09	828.50
17	2167.09	2127.59	2132.56	2113.56	2085.80	2140.59	2186.74	2140.30	2180.37	2101.71
18	745.54	678.13	703.54	749.67	720.60	685.49	742.93	732.61	718.45	706.16
19	45.54	47.06	46.05	41.23	44.35	44.42	42.87	51.73	41.50	43.06
20	962.41	963.23	980.82	910.29	929.53	967.59	971.90	931.23	937.24	922.89
21	1320.22	1274.21	1293.04	1319.53	1333.62	1290.78	1343.74	1323.68	1317.24	1305.40
22	1285.68	1263.59	1263.82	1211.79	1217.34	1289.67	1323.67	1261.25	1329.94	1251.76
23	406.94	415.20	414.40	439.83	415.21	424.99	426.29	450.84	406.06	420.89
24	2282.25	2246.35	2263.97	2235.46	2205.04	2265.31	2308.62	2260.30	2294.27	2239.32
25	164.17	181.94	186.70	165.58	168.56	169.03	168.99	160.79	184.30	156.31
26	586.56	612.81	616.34	586.67	549.48	585.61	580.03	532.28	579.66	575.92
27	489.40	442.62	438.16	444.89	426.83	461.08	456.18	449.11	491.20	444.09

28	1044.38	1066.35	1051.32	1049.91	1065.01	1072.24	1074.27	1059.43	1076.42	1036.47
29	1501.20	1517.53	1521.07	1511.79	1498.00	1510.39	1565.12	1500.42	1516.70	1494.69
30	1105.35	1081.42	1071.19	1096.55	1121.02	1080.99	1152.48	1103.56	1108.43	1105.45
31	194.10	183.11	208.95	207.38	183.98	218.57	197.67	218.70	195.45	202.59
32	2069.91	2049.59	2064.72	2045.45	1987.94	2046.34	2098.49	2042.49	2068.30	2026.45
33	941.49	946.94	933.69	936.30	938.94	949.53	965.53	961.88	957.80	931.58
34	2218.23	2199.06	2206.95	2191.05	2166.31	2194.01	2254.39	2195.44	2235.15	2183.45
35	1172.07	1115.66	1135.42	1129.42	1070.49	1147.57	1185.68	1123.27	1191.60	1139.99
36	299.20	290.07	306.71	294.62	320.32	332.66	334.44	303.00	314.19	291.96
37	1136.45	1160.48	1129.57	1143.72	1097.45	1107.22	1166.30	1087.22	1167.68	1109.66
38	1171.30	1116.52	1107.32	1121.25	1157.53	1182.57	1191.26	1170.74	1176.72	1120.01
39	1484.28	1495.56	1533.88	1478.61	1429.96	1490.74	1516.13	1479.61	1495.93	1463.36
40	2140.37	2144.08	2148.98	2126.53	2088.11	2136.16	2184.05	2144.66	2159.56	2110.23
41	1642.75	1617.68	1588.18	1567.39	1614.53	1593.77	1647.58	1589.06	1645.65	1562.22
42	899.13	879.59	904.60	915.99	898.53	871.10	941.02	879.20	922.60	904.39
43	838.04	778.34	820.52	815.63	769.18	792.27	829.16	786.74	829.62	820.74
44	2190.16	2141.46	2169.38	2136.04	2132.90	2163.94	2204.91	2172.73	2215.96	2128.28
45	534.29	465.03	529.86	488.37	483.36	519.82	520.79	530.20	490.16	497.86
Trip#	TT61	TT62	TT63	TT64	TT65	TT66	TT67	TT68	TT69	TT70
1	1021.64	1068.41	1004.79	984.52	1057.07	1011.00	997.81	1067.34	1069.84	1016.00
2	707.89	706.16	717.88	720.35	737.84	672.47	682.25	719.78	733.90	716.80
3	1478.59	1482.10	1446.73	1482.46	1506.84	1466.04	1446.79	1499.64	1482.42	1462.77
4	2247.92	2233.25	2192.19	2141.20	2246.37	2176.25	2182.83	2272.09	2253.34	2188.80
5	1804.68	1783.24	1784.99	1722.36	1802.46	1754.54	1741.92	1837.64	1825.77	1754.33
6	690.40	706.36	662.23	699.21	743.37	675.67	654.71	726.56	697.90	682.93
7	552.51	563.51	527.52	518.89	520.50	542.07	505.04	536.36	536.84	524.60
8	2071.82	2108.30	2077.37	2006.98	2138.92	2056.01	2045.25	2114.02	2109.68	2024.18
9	1703.16	1697.88	1667.27	1597.61	1663.26	1676.28	1661.57	1701.03	1711.88	1652.97
10	1481.78	1406.60	1386.19	1374.54	1412.73	1413.52	1411.18	1459.45	1456.13	1386.19
11	186.18	169.50	149.32	156.73	172.37	146.64	158.17	172.81	187.56	163.26
12	1522.81	1480.29	1454.15	1408.03	1465.25	1455.79	1461.39	1547.55	1497.64	1466.19
13	2161.66	2183.77	2128.81	2081.79	2200.59	2119.40	2131.87	2197.29	2176.93	2107.60
14	1859.76	1859.53	1807.92	1788.47	1854.05	1832.78	1837.98	1871.34	1891.96	1819.86
15	1785.60	1777.06	1768.48	1705.25	1788.72	1751.31	1738.25	1824.34	1802.90	1740.48
16	859.96	815.17	797.05	785.66	820.92	833.97	802.89	836.20	853.69	794.01
17	2169.99	2144.62	2128.97	2042.33	2161.88	2131.21	2121.27	2186.68	2211.95	2119.89
18	776.30	714.02	727.03	703.50	733.07	722.98	716.30	752.40	730.38	752.36
19	42.15	40.30	44.23	43.90	51.12	44.00	40.74	51.41	49.94	44.08
20	932.32	942.88	920.43	920.74	981.34	942.78	930.82	918.62	960.19	885.09
21	1323.84	1326.83	1296.89	1267.29	1365.99	1314.55	1315.38	1348.06	1373.82	1311.32
22	1272.25	1300.03	1239.73	1207.15	1291.57	1243.30	1251.26	1303.01	1318.09	1265.12
23	457.51	410.98	415.53	403.78	410.28	404.66	401.37	488.47	431.76	425.48
24	2301.27	2285.40	2244.89	2193.57	2301.00	2230.50	2236.38	2325.79	2306.80	2242.49
25	146.21	175.64	164.16	157.08	158.99	173.15	173.58	165.99	173.79	166.79
26	568.38	593.04	560.56	561.97	582.36	561.43	577.66	555.45	589.43	571.45
27	457.31	466.02	485.77	470.91	485.88	436.74	467.78	487.82	457.88	482.81
28	1098.42	1109.67	1035.33	996.64	1102.18	1041.60	1066.72	1051.76	1101.03	1040.72
29	1527.05	1532.54	1466.25	1440.89	1515.64	1499.41	1479.33	1540.75	1563.86	1489.74
30	1102.93	1105.43	1064.21	1083.77	1121.38	1106.85	1067.79	1141.15	1139.23	1066.73
31	218.58	205.84	221.18	193.13	178.38	193.17	188.80	220.74	202.85	187.83
32	2102.71	2051.62	2008.76	1965.35	2057.69	2054.06	2040.88	2096.80	2122.49	2010.02
33	958.12	957.39	944.02	931.56	944.10	924.32	932.21	1036.61	945.35	949.80
34	2241.10	2209.78	2184.57	2138.43	2239.39	2181.27	2164.35	2259.43	2238.98	2154.70
35	1187.91	1154.13	1114.34	1106.18	1161.61	1129.03	1147.81	1189.40	1186.99	1160.23
36	316.86	320.71	284.79	266.94	313.94	286.30	315.77	320.76	328.59	298.41
37	1157.73	1161.13	1125.71	1096.45	1140.48	1142.35	1133.55	1124.03	1173.87	1134.78
38	1151.80	1130.34	1115.75	1122.83	1175.79	1133.54	1122.76	1194.53	1135.26	1100.22
39	1483.41	1468.54	1461.87	1451.41	1460.98	1437.10	1442.85	1516.00	1490.33	1443.94
40	2174.09	2168.55	2111.19	2059.39	2155.51	2095.05	2101.24	2201.99	2195.06	2122.70
41	1611.75	1595.55	1598.27	1582.55	1674.62	1607.83	1613.53	1650.12	1616.16	1602.06
42	884.99	858.87	879.46	852.10	907.09	901.52	877.35	875.06	916.92	883.61
43	842.75	809.45	824.63	794.58	872.96	822.38	805.52	799.05	837.52	800.21
44	2207.10	2185.29	2137.13	2095.15	2200.34	2163.22	2140.39	2227.96	2218.25	2143.17
45	523.75	498.20	509.98	491.15	505.91	489.10	515.11	529.61	507.71	486.73
Trip#	TT71	TT72	TT73	TT74	TT75	TT76	TT77	TT78	TT79	TT80
1	1023.95	1033.58	1028.69	1050.40	1044.23	1011.26	1005.05	1009.62	1040.17	1022.43

2	716.40	708.60	710.55	738.78	709.98	710.17	699.56	679.88	738.18	721.98
3	1477.57	1422.98	1487.50	1437.52	1460.92	1464.05	1487.43	1482.64	1471.37	1467.38
4	2169.16	2186.59	2216.25	2133.82	2189.14	2159.26	2193.11	2208.93	2235.26	2190.34
5	1768.27	1747.50	1775.67	1704.70	1755.04	1735.55	1728.95	1786.52	1804.07	1730.50
6	714.71	668.86	712.98	685.93	687.81	683.76	670.42	700.59	715.01	672.88
7	521.79	522.10	523.77	531.77	496.31	516.71	518.07	552.17	554.75	552.20
8	2038.02	2066.10	2087.49	2056.36	2072.49	2048.07	2049.64	2047.58	2100.61	2058.41
9	1680.02	1677.54	1684.38	1650.27	1617.70	1666.90	1703.19	1667.75	1711.01	1647.71
10	1402.12	1409.99	1428.50	1404.45	1383.15	1373.94	1428.84	1447.28	1433.70	1384.69
11	153.71	173.13	165.93	203.44	155.18	164.43	159.84	149.33	174.65	170.49
12	1446.03	1481.30	1458.87	1400.97	1458.68	1427.33	1464.26	1458.80	1511.25	1467.54
13	2119.07	2111.26	2165.77	2055.15	2132.97	2100.17	2157.45	2150.69	2150.31	2119.22
14	1839.37	1817.14	1862.79	1812.44	1830.81	1822.16	1866.39	1851.71	1860.07	1816.22
15	1772.98	1754.39	1778.28	1700.39	1748.96	1739.01	1779.51	1784.01	1801.98	1712.73
16	819.32	811.84	835.97	809.29	836.00	788.50	804.39	841.08	804.55	792.25
17	2113.26	2101.17	2144.51	2069.56	2087.40	2078.08	2123.03	2157.79	2153.46	2095.82
18	704.36	719.25	721.50	703.41	736.49	717.16	690.46	716.37	735.15	700.25
19	38.98	43.22	44.38	46.10	43.96	46.77	46.57	40.00	41.21	42.04
20	917.65	925.93	936.01	917.34	912.49	924.23	942.77	937.94	941.18	905.68
21	1288.31	1326.60	1333.91	1307.69	1333.61	1281.15	1305.81	1308.41	1322.35	1309.12
22	1271.12	1238.07	1278.14	1194.32	1271.06	1207.54	1276.35	1284.92	1229.89	1257.63
23	407.49	423.99	405.01	358.90	427.16	376.11	415.41	444.55	442.21	401.62
24	2222.41	2239.41	2269.75	2186.51	2241.75	2211.99	2246.02	2261.94	2290.80	2242.12
25	168.15	165.02	146.96	167.96	193.02	187.21	176.74	165.98	172.62	163.52
26	568.16	561.76	571.04	553.21	588.28	617.45	558.54	573.10	609.66	609.35
27	453.25	429.82	482.83	398.88	448.93	441.49	468.07	459.82	431.29	457.92
28	1053.46	1049.62	1104.71	1030.16	1072.28	1049.13	1053.41	1054.12	1060.57	1061.21
29	1515.66	1508.48	1496.08	1476.47	1503.60	1490.91	1499.23	1507.64	1538.02	1490.27
30	1082.37	1141.31	1091.98	1136.13	1111.25	1064.97	1083.08	1067.34	1125.54	1067.68
31	194.26	200.62	198.21	179.01	171.09	201.09	191.77	194.93	211.43	191.45
32	2021.54	2026.40	2045.48	2003.15	2005.03	1996.37	2043.93	2082.22	2072.98	2019.56
33	973.47	954.73	956.82	880.24	944.79	906.71	958.36	985.59	992.34	917.73
34	2160.08	2174.59	2199.17	2145.82	2163.66	2157.83	2161.14	2190.81	2228.16	2159.95
35	1154.81	1134.52	1134.78	1116.87	1144.55	1083.89	1162.86	1157.62	1120.81	1143.47
36	313.25	318.56	296.19	300.10	326.16	286.12	297.87	297.80	299.38	290.05
37	1115.72	1124.34	1124.43	1120.27	1138.67	1136.94	1129.97	1073.63	1134.75	1156.32
38	1102.33	1100.05	1157.64	1099.13	1165.34	1106.54	1122.78	1138.52	1139.59	1097.55
39	1487.17	1460.89	1474.95	1443.72	1459.51	1469.71	1468.02	1496.29	1523.09	1436.49
40	2105.43	2123.64	2142.60	2065.74	2124.83	2094.42	2122.20	2135.91	2175.99	2110.38
41	1558.07	1567.65	1616.28	1529.63	1624.46	1565.86	1598.83	1608.33	1627.33	1587.22
42	887.97	870.07	877.66	901.90	903.91	849.19	855.46	919.60	885.02	869.78
43	813.21	802.23	819.12	813.76	785.81	785.18	808.35	788.77	795.23	808.94
44	2141.57	2144.43	2175.46	2101.09	2138.81	2131.23	2158.52	2158.52	2188.20	2114.58
45	501.05	513.44	515.85	483.44	485.72	482.44	512.36	546.11	529.51	465.41
Trip#	TT81	TT82	TT83	TT84	TT85	TT86	TT87	TT88	TT89	TT90
1	984.65	1036.83	1002.24	1025.05	1053.53	1035.18	1045.28	1013.65	1014.42	1011.02
2	690.31	688.04	685.14	692.98	748.94	714.39	721.94	678.09	699.15	696.01
3	1424.53	1499.35	1452.69	1495.36	1481.82	1510.05	1514.72	1441.22	1483.60	1458.52
4	2109.88	2226.52	2134.66	2211.40	2227.56	2215.69	2237.71	2137.27	2158.67	2188.37
5	1668.41	1793.37	1716.11	1762.67	1818.46	1774.57	1824.02	1699.34	1735.69	1761.28
6	637.37	707.11	666.10	721.90	725.24	727.85	713.64	655.92	673.40	687.82
7	532.42	528.62	508.68	549.34	578.55	525.01	497.34	520.61	504.13	544.46
8	2002.13	2100.01	2017.62	2078.91	2099.83	2059.88	2100.45	2020.52	2017.71	2052.35
9	1633.97	1722.06	1647.20	1675.25	1709.62	1695.75	1711.88	1651.42	1632.39	1678.03
10	1347.98	1399.14	1380.10	1440.86	1454.22	1441.77	1488.80	1387.30	1397.46	1423.10
11	148.19	150.73	169.13	165.35	183.27	155.51	187.04	150.43	166.08	157.59
12	1407.66	1486.93	1426.77	1479.63	1489.17	1493.03	1480.86	1431.17	1422.64	1474.00
13	2057.43	2186.86	2102.80	2185.55	2153.70	2166.92	2195.21	2085.57	2101.47	2129.74
14	1771.75	1854.43	1804.64	1845.42	1877.57	1903.68	1877.06	1831.16	1825.62	1842.28
15	1689.78	1777.53	1720.95	1773.75	1811.69	1813.32	1815.31	1711.68	1707.64	1790.05
16	785.56	794.48	804.34	796.71	823.36	821.01	828.11	823.23	790.24	815.37
17	2041.30	2156.28	2085.99	2119.59	2173.66	2146.62	2173.27	2080.95	2071.93	2129.41
18	678.60	731.10	686.22	717.27	752.24	722.57	742.32	701.85	698.68	709.87
19	42.97	43.72	45.05	32.88	43.17	49.97	40.73	48.73	46.40	44.88
20	914.11	968.68	937.76	955.28	954.15	901.54	925.43	916.07	949.99	917.36
21	1273.52	1315.77	1288.86	1313.97	1354.01	1338.42	1343.34	1303.09	1282.44	1304.82

22	1177.40	1261.07	1239.84	1245.69	1271.76	1315.03	1322.60	1244.47	1252.82	1260.15
23	362.89	412.56	406.14	429.67	436.20	435.35	441.80	385.24	404.62	441.62
24	2161.81	2279.77	2187.61	2263.67	2280.89	2269.44	2289.55	2189.87	2210.39	2241.45
25	161.22	195.46	172.35	192.52	164.78	155.29	166.74	177.89	173.87	154.44
26	598.75	609.07	562.22	609.07	593.13	548.22	552.07	577.44	569.93	547.45
27	441.23	472.00	431.34	460.46	436.71	491.17	472.81	429.19	468.88	454.81
28	1045.57	1062.23	1053.42	1107.83	1068.98	1063.51	1107.39	1027.74	1064.72	1042.21
29	1440.39	1516.42	1480.76	1495.10	1581.00	1530.89	1554.76	1482.99	1450.19	1496.19
30	996.51	1073.80	1047.07	1036.58	1133.95	1105.81	1130.88	1073.41	1063.55	1097.50
31	204.30	217.38	198.61	214.59	202.62	187.02	197.11	193.50	188.39	202.83
32	1962.95	2055.48	2014.69	2062.34	2082.43	2041.82	2082.64	2004.55	2003.51	2033.81
33	890.53	943.89	889.15	957.21	963.30	993.34	1004.20	884.02	904.02	960.30
34	2095.76	2221.35	2128.33	2206.70	2223.71	2181.01	2229.92	2125.26	2157.02	2180.49
35	1072.09	1143.98	1099.26	1139.45	1153.80	1170.51	1196.43	1126.71	1143.10	1120.04
36	298.35	317.02	284.96	308.75	324.58	308.01	336.68	319.55	294.35	283.99
37	1100.54	1166.75	1111.81	1127.58	1145.12	1123.92	1146.58	1126.16	1120.64	1074.56
38	1038.99	1127.26	1083.86	1155.07	1138.72	1189.00	1155.29	1097.61	1103.26	1137.35
39	1413.38	1508.96	1440.61	1500.07	1493.59	1472.54	1525.89	1436.75	1457.72	1464.28
40	2039.32	2149.61	2068.49	2139.77	2167.99	2150.26	2166.16	2067.21	2081.26	2129.30
41	1517.56	1622.74	1552.19	1633.42	1590.49	1600.15	1639.76	1517.38	1591.20	1581.18
42	810.78	906.69	864.40	874.81	919.49	882.99	889.01	882.41	841.58	890.94
43	804.59	838.15	806.44	784.32	835.71	787.16	830.78	819.36	796.56	782.83
44	2064.53	2186.78	2117.63	2174.27	2185.97	2173.88	2218.16	2102.90	2113.71	2156.29
45	495.86	523.57	498.05	516.51	506.44	491.10	529.60	491.17	494.06	495.67
Trip#	TT91	TT92	TT93	TT94	TT95	TT96	TT97	TT98	TT99	TT100
1	1027.19	1004.11	1001.78	1009.08	1024.13	1047.53	1033.87	1013.72	1027.62	1010.55
2	690.14	718.59	696.02	708.50	670.66	717.42	707.78	690.79	686.91	715.07
3	1449.47	1485.46	1487.65	1467.85	1462.56	1512.95	1478.33	1450.12	1422.22	1472.96
4	2193.64	2214.18	2198.26	2174.76	2195.41	2270.76	2186.74	2128.95	2124.03	2143.69
5	1798.93	1815.71	1761.74	1737.80	1757.85	1829.69	1775.84	1706.37	1691.03	1707.87
6	699.63	702.91	681.53	666.13	652.65	729.28	658.71	672.63	683.95	659.68
7	542.62	544.44	510.96	524.72	536.31	531.16	515.50	516.99	551.25	526.60
8	2092.86	2059.23	2044.11	2016.37	2035.72	2097.24	2051.76	1974.46	2028.30	2011.32
9	1660.07	1701.03	1665.14	1647.75	1704.49	1700.75	1686.29	1608.64	1679.02	1646.40
10	1433.89	1461.60	1440.89	1402.22	1380.97	1393.07	1421.76	1331.05	1379.05	1364.45
11	153.18	177.88	161.32	179.71	151.33	154.37	172.22	143.87	181.20	157.04
12	1468.77	1461.56	1451.05	1402.76	1472.15	1490.94	1473.97	1417.58	1431.42	1432.92
13	2131.92	2144.94	2136.81	2115.42	2138.09	2185.34	2121.97	2047.10	2076.47	2081.70
14	1821.02	1861.65	1846.15	1821.95	1862.02	1913.32	1860.33	1809.03	1802.31	1817.77
15	1769.45	1798.24	1763.41	1756.54	1739.87	1801.27	1759.23	1693.20	1714.13	1710.52
16	840.64	805.57	817.16	808.37	826.89	871.05	808.15	799.72	741.17	791.44
17	2145.95	2182.32	2130.80	2115.41	2134.29	2180.72	2126.26	2070.11	2071.20	2066.01
18	730.12	749.23	726.26	700.79	682.08	741.65	704.79	710.72	669.98	683.17
19	45.73	38.74	44.66	51.42	45.39	45.17	42.06	44.88	45.93	46.71
20	944.97	921.46	920.81	917.33	966.31	1003.22	917.91	882.59	927.97	915.82
21	1353.44	1320.10	1323.73	1272.84	1252.88	1296.89	1301.94	1257.75	1284.20	1253.91
22	1266.41	1287.85	1277.84	1239.92	1284.84	1314.37	1295.03	1249.66	1203.15	1222.17
23	421.79	421.36	422.98	404.80	411.47	406.33	405.54	388.90	386.47	389.97
24	2246.81	2267.86	2250.17	2228.05	2248.27	2325.15	2240.04	2181.42	2176.80	2196.15
25	165.96	154.58	157.40	153.16	182.56	199.42	144.92	158.30	159.61	179.73
26	559.14	533.30	540.52	538.58	593.21	622.44	550.98	561.96	561.89	595.05
27	444.03	481.23	476.48	472.25	443.15	481.58	479.03	451.82	418.56	432.76
28	1053.21	1054.54	1056.39	1035.04	1041.84	1085.63	1056.80	1025.29	1038.63	1034.76
29	1511.82	1522.39	1493.09	1469.83	1493.76	1525.51	1512.69	1477.55	1460.58	1464.88
30	1082.05	1076.69	1097.03	1062.05	1067.10	1097.34	1092.45	1058.49	1062.18	1041.51
31	210.73	231.84	191.01	200.16	219.44	188.75	192.17	167.25	207.23	184.27
32	2060.74	2070.49	2047.62	2021.89	2052.01	2079.88	2037.66	1983.40	1967.04	2011.45
33	923.16	963.44	952.39	958.67	915.79	917.42	957.55	910.79	894.27	894.48
34	2199.94	2196.03	2185.68	2151.32	2175.20	2239.29	2185.58	2110.77	2142.91	2134.84
35	1109.70	1165.30	1170.66	1169.67	1149.57	1169.08	1146.41	1141.16	1046.90	1124.40
36	321.67	300.66	296.55	291.82	293.22	301.14	319.95	306.91	283.45	283.52
37	1103.83	1152.65	1113.91	1104.96	1155.42	1183.82	1136.93	1127.78	1082.31	1141.15
38	1154.59	1126.25	1145.28	1090.47	1082.12	1152.54	1109.61	1104.00	1086.40	1067.69
39	1459.45	1500.13	1461.09	1445.86	1504.96	1504.83	1462.44	1409.70	1432.53	1457.53
40	2102.16	2139.50	2112.45	2104.55	2135.85	2198.15	2109.21	2071.41	2064.42	2082.96
41	1588.94	1595.69	1611.42	1570.59	1557.46	1637.37	1580.88	1554.76	1549.55	1544.09

42	880.94	882.98	885.64	847.26	893.96	900.07	842.61	887.87	869.27	852.87
43	818.34	830.45	801.00	797.50	829.41	847.22	819.14	791.31	787.66	802.76
44	2159.11	2200.04	2159.10	2128.00	2145.14	2226.34	2135.49	2076.37	2093.26	2092.92
45	529.24	528.88	514.76	508.44	523.23	513.09	502.93	461.28	476.98	464.34
Trip#	TT101	TT102	TT103	TT104	TT105	TT106	TT107	TT108	TT109	TT110
1	1053.72	1038.01	1044.77	1010.82	1071.96	1024.70	1077.59	994.51	1061.16	1037.23
2	682.60	700.95	723.23	705.23	726.36	684.98	718.80	689.57	736.07	687.30
3	1474.99	1479.39	1518.45	1494.32	1494.81	1473.16	1568.59	1463.65	1511.55	1425.90
4	2126.93	2202.70	2255.44	2159.96	2241.19	2205.99	2284.22	2185.63	2216.50	2153.80
5	1710.38	1757.18	1799.22	1752.37	1782.30	1765.29	1841.26	1759.54	1795.07	1717.99
6	716.16	686.56	713.21	698.12	708.27	695.90	762.75	674.14	742.20	686.86
7	530.08	507.33	535.25	521.32	569.27	542.23	559.17	516.30	527.98	521.44
8	2021.91	2069.31	2096.64	2016.69	2083.93	2071.97	2131.05	2014.48	2075.74	2057.54
9	1671.19	1682.02	1750.89	1654.18	1717.77	1671.08	1761.09	1648.18	1662.44	1674.47
10	1344.20	1406.78	1436.65	1418.63	1452.36	1431.29	1479.10	1422.08	1421.80	1380.95
11	171.90	160.74	171.24	167.44	200.09	167.35	167.74	167.77	187.91	165.06
12	1455.42	1467.23	1472.72	1431.56	1509.46	1468.47	1484.92	1456.21	1458.21	1436.81
13	2084.68	2157.43	2186.46	2111.31	2160.29	2152.90	2229.17	2121.73	2145.79	2113.78
14	1795.13	1859.27	1905.00	1838.15	1906.58	1833.61	1918.69	1819.76	1872.85	1806.11
15	1697.00	1762.77	1830.67	1749.96	1795.14	1749.92	1843.54	1730.95	1760.49	1734.73
16	748.64	834.69	821.73	787.54	806.31	844.20	840.98	814.45	808.19	805.32
17	2067.93	2123.33	2183.79	2104.59	2170.51	2140.17	2237.01	2137.05	2156.33	2115.22
18	678.85	694.68	730.78	691.53	732.95	739.22	744.45	720.35	722.61	670.41
19	43.51	44.05	53.09	35.97	53.92	46.35	49.00	38.34	42.64	43.89
20	934.26	956.29	971.86	914.94	947.81	942.08	908.40	879.34	929.19	928.70
21	1261.45	1308.93	1331.80	1275.30	1345.74	1332.80	1355.01	1298.78	1311.35	1311.24
22	1203.89	1275.43	1274.26	1265.95	1290.98	1255.84	1330.54	1264.59	1272.56	1230.22
23	393.56	427.22	412.84	427.68	434.65	426.13	445.57	417.38	380.94	398.17
24	2181.37	2255.18	2306.83	2212.76	2295.34	2259.65	2337.38	2240.42	2268.91	2207.06
25	184.75	190.02	161.33	156.55	150.56	176.23	187.56	144.06	171.75	172.49
26	569.49	578.14	585.79	546.22	575.25	569.44	590.71	555.24	592.01	575.55
27	410.41	459.77	459.98	447.50	472.55	447.17	471.79	497.29	497.14	408.69
28	1021.24	1073.00	1112.75	1033.33	1084.98	1048.62	1085.48	1067.21	1077.35	1056.46
29	1496.10	1489.81	1549.43	1481.52	1538.94	1515.99	1566.89	1492.13	1497.48	1509.99
30	1097.30	1075.47	1067.00	1053.46	1110.75	1088.60	1117.09	1088.47	1090.27	1091.38
31	182.94	203.29	213.44	188.43	200.57	214.53	225.83	196.67	176.34	192.47
32	1975.64	2040.86	2081.97	2012.84	2085.90	2055.22	2122.99	2038.79	2047.83	2030.71
33	918.60	938.60	969.73	943.43	962.83	932.68	1008.95	982.73	955.04	915.58
34	2152.69	2178.51	2220.03	2154.27	2224.93	2193.54	2265.33	2157.96	2202.53	2149.21
35	1076.34	1150.51	1149.80	1135.16	1181.86	1144.03	1199.12	1158.26	1160.07	1099.94
36	311.57	305.42	306.09	284.29	327.79	307.49	301.00	286.95	307.62	306.84
37	1121.39	1128.51	1122.28	1091.41	1149.66	1124.11	1139.57	1116.22	1154.88	1107.33
38	1095.26	1117.71	1144.25	1101.67	1143.44	1146.24	1206.98	1109.44	1181.47	1117.28
39	1436.09	1500.36	1504.54	1498.75	1479.92	1472.94	1566.33	1426.29	1439.88	1431.89
40	2071.51	2130.91	2184.28	2090.06	2187.34	2128.72	2212.56	2115.38	2130.94	2088.55
41	1576.25	1586.79	1636.11	1572.78	1609.03	1583.76	1648.85	1588.93	1656.99	1559.72
42	885.62	863.15	893.71	886.73	877.67	894.49	922.23	865.07	884.83	918.48
43	790.36	812.16	799.45	797.90	823.08	815.95	811.08	778.48	809.78	793.58
44	2114.27	2158.54	2206.32	2116.91	2186.02	2170.61	2266.24	2154.97	2178.96	2110.58
45	454.05	529.17	547.97	497.01	512.94	518.61	546.14	490.13	476.31	498.09
Trip#	TT101	TT102	TT103	TT104	TT105	TT106	TT107	TT108	TT109	TT110
1	1053.72	1038.01	1044.77	1010.82	1071.96	1024.70	1077.59	994.51	1061.16	1037.23
2	682.60	700.95	723.23	705.23	726.36	684.98	718.80	689.57	736.07	687.30
3	1474.99	1479.39	1518.45	1494.32	1494.81	1473.16	1568.59	1463.65	1511.55	1425.90
4	2126.93	2202.70	2255.44	2159.96	2241.19	2205.99	2284.22	2185.63	2216.50	2153.80
5	1710.38	1757.18	1799.22	1752.37	1782.30	1765.29	1841.26	1759.54	1795.07	1717.99
6	716.16	686.56	713.21	698.12	708.27	695.90	762.75	674.14	742.20	686.86
7	530.08	507.33	535.25	521.32	569.27	542.23	559.17	516.30	527.98	521.44
8	2021.91	2069.31	2096.64	2016.69	2083.93	2071.97	2131.05	2014.48	2075.74	2057.54
9	1671.19	1682.02	1750.89	1654.18	1717.77	1671.08	1761.09	1648.18	1662.44	1674.47
10	1344.20	1406.78	1436.65	1418.63	1452.36	1431.29	1479.10	1422.08	1421.80	1380.95
11	171.90	160.74	171.24	167.44	200.09	167.35	167.74	167.77	187.91	165.06
12	1455.42	1467.23	1472.72	1431.56	1509.46	1468.47	1484.92	1456.21	1458.21	1436.81
13	2084.68	2157.43	2186.46	2111.31	2160.29	2152.90	2229.17	2121.73	2145.79	2113.78
14	1795.13	1859.27	1905.00	1838.15	1906.58	1833.61	1918.69	1819.76	1872.85	1806.11
15	1697.00	1762.77	1830.67	1749.96	1795.14	1749.92	1843.54	1730.95	1760.49	1734.73

16	748.64	834.69	821.73	787.54	806.31	844.20	840.98	814.45	808.19	805.32
17	2067.93	2123.33	2183.79	2104.59	2170.51	2140.17	2237.01	2137.05	2156.33	2115.22
18	678.85	694.68	730.78	691.53	732.95	739.22	744.45	720.35	722.61	670.41
19	43.51	44.05	53.09	35.97	53.92	46.35	49.00	38.34	42.64	43.89
20	934.26	956.29	971.86	914.94	947.81	942.08	908.40	879.34	929.19	928.70
21	1261.45	1308.93	1331.80	1275.30	1345.74	1332.80	1355.01	1298.78	1311.35	1311.24
22	1203.89	1275.43	1274.26	1265.95	1290.98	1255.84	1330.54	1264.59	1272.56	1230.22
23	393.56	427.22	412.84	427.68	434.65	426.13	445.57	417.38	380.94	398.17
24	2181.37	2255.18	2306.83	2212.76	2295.34	2259.65	2337.38	2240.42	2268.91	2207.06
25	184.75	190.02	161.33	156.55	150.56	176.23	187.56	144.06	171.75	172.49
26	569.49	578.14	585.79	546.22	575.25	569.44	590.71	555.24	592.01	575.55
27	410.41	459.77	459.98	447.50	472.55	447.17	471.79	497.29	497.14	408.69
28	1021.24	1073.00	1112.75	1033.33	1084.98	1048.62	1085.48	1067.21	1077.35	1056.46
29	1496.10	1489.81	1549.43	1481.52	1538.94	1515.99	1566.89	1492.13	1497.48	1509.99
30	1097.30	1075.47	1067.00	1053.46	1110.75	1088.60	1117.09	1088.47	1090.27	1091.38
31	182.94	203.29	213.44	188.43	200.57	214.53	225.83	196.67	176.34	192.47
32	1975.64	2040.86	2081.97	2012.84	2085.90	2055.22	2122.99	2038.79	2047.83	2030.71
33	918.60	938.60	969.73	943.43	962.83	932.68	1008.95	982.73	955.04	915.58
34	2152.69	2178.51	2220.03	2154.27	2224.93	2193.54	2265.33	2157.96	2202.53	2149.21
35	1076.34	1150.51	1149.80	1135.16	1181.86	1144.03	1199.12	1158.26	1160.07	1099.94
36	311.57	305.42	306.09	284.29	327.79	307.49	301.00	286.95	307.62	306.84
37	1121.39	1128.51	1122.28	1091.41	1149.66	1124.11	1139.57	1116.22	1154.88	1107.33
38	1095.26	1117.71	1144.25	1101.67	1143.44	1146.24	1206.98	1109.44	1181.47	1117.28
39	1436.09	1500.36	1504.54	1498.75	1479.92	1472.94	1566.33	1426.29	1439.88	1431.89
40	2071.51	2130.91	2184.28	2090.06	2187.34	2128.72	2212.56	2115.38	2130.94	2088.55
41	1576.25	1586.79	1636.11	1572.78	1609.03	1583.76	1648.85	1588.93	1656.99	1559.72
42	885.62	863.15	893.71	886.73	877.67	894.49	922.23	865.07	884.83	918.48
43	790.36	812.16	799.45	797.90	823.08	815.95	811.08	778.48	809.78	793.58
44	2114.27	2158.54	2206.32	2116.91	2186.02	2170.61	2266.24	2154.97	2178.96	2110.58
45	454.05	529.17	547.97	497.01	512.94	518.61	546.14	490.13	476.31	498.09
Trip#	TT111	TT112	TT113	TT114	TT115	TT116	TT117	TT118	TT119	TT120
1	998.84	1020.43	1060.79	1040.60	1046.88	1078.67	1080.45	1025.21	996.59	1001.39
2	702.11	713.40	719.65	671.94	681.76	705.04	724.13	726.85	680.05	709.62
3	1437.83	1468.74	1510.22	1465.89	1474.25	1522.02	1511.07	1430.83	1474.44	1511.44
4	2180.88	2142.41	2282.66	2162.18	2192.36	2182.57	2255.92	2150.27	2181.67	2198.97
5	1741.75	1742.17	1815.13	1719.50	1775.27	1756.55	1834.92	1727.60	1773.55	1779.47
6	669.93	699.61	702.88	701.59	708.47	698.14	727.99	714.17	693.20	712.33
7	546.15	496.83	517.36	550.20	539.45	526.73	537.71	501.32	553.08	565.31
8	2080.37	2035.40	2129.36	2024.25	2069.30	2069.54	2116.35	2033.28	2059.98	2023.82
9	1670.54	1638.95	1749.95	1686.75	1688.09	1671.75	1750.32	1626.62	1683.59	1653.79
10	1397.26	1363.46	1481.73	1373.00	1416.64	1433.44	1455.42	1340.78	1455.59	1449.18
11	152.48	164.24	175.85	161.96	161.57	188.07	169.30	167.24	144.87	163.89
12	1447.53	1415.72	1532.45	1469.70	1502.90	1419.21	1505.46	1435.66	1463.48	1471.78
13	2119.13	2094.31	2215.54	2110.89	2151.26	2137.47	2169.42	2075.29	2140.03	2127.63
14	1843.66	1791.75	1867.66	1868.78	1839.96	1873.44	1909.00	1819.95	1829.09	1837.93
15	1747.58	1722.43	1820.34	1722.34	1763.05	1729.61	1830.12	1716.35	1797.85	1785.88
16	819.18	774.13	866.49	786.55	781.27	814.79	836.10	782.26	827.73	827.00
17	2095.53	2089.67	2199.60	2102.85	2126.75	2122.24	2200.88	2067.66	2139.50	2135.88
18	714.11	685.22	754.39	703.21	716.43	678.02	755.55	694.14	753.16	765.63
19	46.69	38.32	46.89	40.15	45.26	47.61	46.31	49.33	49.02	42.40
20	934.33	912.61	968.86	948.58	915.57	940.85	918.72	930.60	908.72	925.58
21	1315.65	1271.54	1344.34	1295.98	1339.20	1316.17	1356.24	1283.92	1360.44	1336.16
22	1229.33	1211.49	1291.47	1280.36	1271.90	1317.00	1299.67	1207.45	1246.54	1260.72
23	399.12	381.16	452.19	385.81	437.94	379.44	419.10	372.22	459.00	462.57
24	2233.01	2194.62	2335.31	2215.83	2247.41	2236.36	2307.85	2203.07	2234.11	2251.68
25	167.20	186.82	183.30	187.13	144.96	188.97	158.24	167.21	164.79	152.32
26	585.15	595.22	565.74	561.09	548.88	575.40	590.31	585.45	559.19	566.41
27	432.63	449.77	461.15	437.93	488.03	447.66	461.22	456.41	462.99	458.09
28	1053.42	1011.68	1090.79	1056.00	1074.75	1055.33	1103.79	1052.23	1015.20	1065.24
29	1487.80	1484.41	1541.82	1510.71	1501.34	1526.53	1579.95	1443.42	1509.30	1529.34
30	1065.59	1080.35	1112.54	1072.38	1090.61	1117.27	1147.43	1094.71	1054.15	1030.95
31	223.11	174.39	221.17	186.98	207.95	182.20	204.14	182.15	224.66	196.28
32	2013.47	1985.66	2107.41	2007.69	2021.14	2038.49	2100.65	1965.83	2048.20	2074.80
33	886.21	941.59	973.35	904.68	1001.59	920.68	988.63	913.33	967.30	945.93
34	2176.65	2134.66	2261.51	2141.49	2194.38	2184.32	2260.93	2128.71	2176.94	2186.35
35	1098.73	1092.79	1173.24	1128.17	1120.55	1158.08	1176.64	1106.53	1099.69	1147.46

36	299.10	303.39	318.55	327.05	314.96	335.81	321.76	297.27	277.99	285.41
37	1134.55	1107.31	1165.19	1154.21	1095.13	1128.02	1174.37	1142.25	1060.34	1104.03
38	1102.00	1096.28	1160.70	1111.62	1167.43	1152.36	1167.02	1098.49	1136.20	1104.89
39	1497.71	1441.16	1522.99	1445.59	1440.22	1481.55	1499.86	1436.69	1494.97	1478.19
40	2101.11	2065.56	2210.50	2094.63	2116.74	2115.76	2190.00	2094.16	2100.32	2137.51
41	1523.74	1595.39	1643.38	1563.11	1625.53	1583.52	1624.51	1574.46	1565.96	1572.96
42	873.08	883.36	891.53	861.26	864.92	895.04	925.34	875.19	888.00	876.45
43	843.41	789.25	845.70	810.48	773.47	794.21	820.05	806.06	800.48	806.91
44	2118.90	2111.37	2244.11	2141.37	2151.14	2145.37	2223.20	2108.33	2157.90	2160.42
45	515.56	477.25	548.35	497.20	511.34	496.75	487.86	471.54	558.79	512.50
Trip#	TT121	TT122	TT123	TT124	TT125	TT126	TT127	TT128	TT129	TT130
1	1020.46	1073.70	1035.37	1026.29	1063.44	1035.65	1019.70	1016.48	1061.82	1076.69
2	721.19	752.13	732.85	708.35	720.63	705.58	695.87	699.84	682.28	744.01
3	1452.71	1512.99	1506.54	1472.20	1465.15	1489.94	1460.19	1429.38	1501.52	1538.66
4	2158.21	2227.99	2179.32	2133.02	2215.91	2197.19	2143.51	2141.37	2222.64	2277.80
5	1736.60	1775.80	1764.73	1737.54	1786.77	1779.47	1721.32	1726.96	1776.27	1867.94
6	679.66	741.10	680.77	727.72	669.53	708.85	687.68	661.40	724.09	722.69
7	545.09	538.34	532.59	550.13	536.65	524.58	551.57	496.97	519.12	551.87
8	2050.30	2083.73	2026.80	2018.66	2097.56	2060.58	2013.57	1985.86	2070.41	2165.25
9	1651.35	1731.58	1701.32	1675.17	1692.54	1691.11	1636.07	1645.86	1695.86	1721.07
10	1417.51	1412.29	1381.72	1365.85	1389.76	1368.63	1355.91	1312.07	1439.24	1440.00
11	183.11	175.42	156.23	163.77	174.69	143.03	148.40	161.24	172.27	162.92
12	1423.39	1470.22	1468.03	1421.72	1466.54	1465.26	1440.29	1405.88	1493.22	1507.59
13	2116.74	2147.36	2102.56	2113.19	2148.63	2133.57	2095.05	2051.11	2165.22	2222.46
14	1801.48	1893.03	1874.88	1855.84	1822.94	1851.37	1816.72	1822.96	1880.30	1931.80
15	1736.97	1774.29	1749.09	1773.14	1755.95	1765.29	1736.92	1704.37	1758.86	1835.92
16	785.40	830.69	817.29	745.60	829.39	805.23	800.90	809.20	826.47	824.23
17	2097.94	2144.92	2108.74	2078.89	2132.44	2120.38	2065.22	2068.21	2139.89	2201.36
18	740.52	715.85	719.53	642.58	706.49	706.41	701.48	691.99	706.14	762.04
19	46.03	41.22	39.71	48.70	45.00	44.78	48.64	47.38	46.40	50.00
20	904.59	945.25	913.26	934.82	979.28	1003.21	907.92	917.42	973.47	950.82
21	1349.34	1291.36	1286.63	1268.02	1295.82	1276.40	1289.18	1230.05	1301.58	1377.18
22	1244.63	1261.82	1275.12	1243.48	1221.97	1258.88	1238.27	1242.30	1287.60	1352.15
23	410.84	382.15	387.10	403.59	406.76	402.12	420.29	375.95	432.04	426.61
24	2212.39	2281.37	2233.31	2186.63	2268.12	2251.12	2195.16	2195.17	2276.24	2331.90
25	163.14	183.26	171.20	164.87	177.19	172.33	178.62	151.43	194.56	188.05
26	581.07	600.80	603.67	583.27	603.25	587.68	576.88	582.29	577.59	633.56
27	458.64	441.33	468.28	435.98	444.17	454.13	456.78	451.95	449.20	495.68
28	1052.66	1076.67	1053.98	1050.14	1094.07	1063.07	1030.77	1037.49	1062.11	1086.28
29	1503.17	1519.39	1508.39	1505.80	1513.12	1515.74	1453.38	1454.39	1508.91	1565.33
30	1061.62	1120.27	1047.71	1080.11	1076.69	1071.56	1039.18	1071.26	1154.28	1157.38
31	199.40	194.69	192.64	197.64	227.86	199.14	213.46	184.94	194.23	177.87
32	2011.46	2053.60	2012.31	1988.64	2059.57	2007.43	1996.34	1958.64	2060.45	2106.71
33	922.14	925.17	928.14	934.44	939.26	941.87	906.03	900.77	957.50	939.90
34	2147.78	2210.84	2154.47	2147.25	2216.21	2186.05	2147.50	2119.50	2221.42	2287.65
35	1140.83	1157.93	1143.71	1109.35	1109.84	1100.08	1129.38	1118.13	1162.84	1202.37
36	302.03	298.44	309.40	300.10	301.29	299.65	281.62	267.07	308.65	325.51
37	1112.08	1181.74	1155.04	1109.94	1166.71	1140.10	1110.66	1108.96	1160.84	1221.08
38	1091.11	1150.84	1081.36	1097.33	1096.95	1115.14	1102.82	1076.03	1150.48	1186.84
39	1440.40	1509.41	1486.34	1469.76	1495.38	1486.53	1453.75	1421.16	1517.46	1515.58
40	2088.68	2166.23	2114.80	2087.74	2158.40	2139.27	2079.06	2070.52	2157.53	2193.48
41	1551.63	1585.04	1546.19	1532.79	1584.43	1607.77	1531.53	1552.81	1624.73	1671.71
42	884.86	922.82	848.14	871.94	846.34	871.00	860.06	855.61	885.74	928.39
43	815.78	829.11	833.07	779.34	799.43	794.96	792.43	771.17	808.78	892.76
44	2117.30	2175.75	2133.08	2100.28	2152.29	2149.85	2106.26	2091.25	2200.25	2228.18
45	496.67	495.74	504.45	455.40	518.68	487.53	485.70	463.71	505.44	483.89
Trip#	TT131	TT132	TT133	TT134	TT135	TT136	TT137	TT138	TT139	TT140
1	943.15	1024.96	1016.36	1083.44	966.41	1003.62	1103.52	1045.01	1054.44	1023.96
2	693.64	701.70	711.03	736.04	673.74	722.70	746.82	708.43	703.46	699.34
3	1418.82	1438.30	1491.12	1515.39	1444.14	1474.74	1547.29	1486.05	1501.57	1428.39
4	2113.92	2176.16	2177.41	2222.50	2129.19	2187.56	2314.28	2187.20	2218.95	2138.45
5	1700.86	1771.69	1741.70	1804.97	1674.59	1775.71	1857.72	1786.89	1787.99	1687.00
6	647.99	684.17	721.34	725.09	685.06	710.42	748.08	672.07	727.14	670.25
7	517.28	547.08	556.02	544.27	506.80	534.19	556.23	523.70	509.37	527.90
8	1945.49	2064.42	2036.95	2110.93	1982.37	2068.99	2161.75	2037.19	2066.66	2017.95
9	1606.36	1643.89	1678.32	1702.06	1634.49	1649.40	1748.73	1679.48	1723.19	1630.33

10	1357.70	1427.60	1404.12	1418.62	1413.12	1455.74	1483.17	1422.46	1426.31	1353.23
11	144.18	177.23	173.34	182.29	167.62	172.60	183.19	175.33	166.56	172.05
12	1390.67	1468.53	1431.24	1441.97	1441.03	1449.32	1533.73	1451.99	1505.61	1425.52
13	2050.70	2122.31	2125.00	2156.10	2076.93	2137.04	2220.83	2126.84	2167.73	2082.98
14	1791.12	1817.09	1849.86	1867.15	1815.88	1827.35	1904.91	1830.19	1901.14	1809.07
15	1716.60	1758.72	1752.88	1776.09	1712.00	1763.08	1839.54	1744.01	1788.73	1713.05
16	788.90	790.08	786.33	805.21	783.62	808.82	839.17	836.02	805.10	774.94
17	2066.00	2112.88	2102.28	2145.99	2053.87	2117.71	2232.27	2131.74	2141.10	2059.02
18	668.31	702.99	701.02	725.05	686.69	742.46	764.02	743.05	712.78	659.43
19	48.72	45.96	42.24	42.39	49.77	38.55	44.90	37.20	49.08	48.45
20	904.01	953.93	928.41	990.23	907.09	916.88	952.45	905.79	967.97	912.73
21	1245.44	1343.69	1293.18	1302.81	1288.47	1338.32	1390.21	1286.80	1306.57	1268.15
22	1210.76	1228.60	1249.63	1263.83	1223.46	1234.07	1327.85	1254.81	1286.13	1212.94
23	399.97	429.56	400.29	378.41	411.39	448.40	433.60	424.58	445.62	381.50
24	2165.50	2228.95	2230.43	2275.60	2183.07	2241.26	2367.94	2240.38	2273.62	2191.13
25	133.14	164.97	152.07	195.45	149.73	170.50	164.31	163.52	176.79	161.23
26	559.04	597.07	588.87	595.67	532.14	575.34	608.47	578.42	576.26	582.99
27	450.12	446.16	441.35	453.20	440.66	464.99	478.47	461.83	491.35	447.42
28	1040.80	1053.79	1071.59	1069.49	1058.57	1030.88	1092.13	1080.38	1074.79	1055.47
29	1449.70	1511.58	1520.64	1529.97	1446.89	1494.81	1588.53	1515.38	1487.20	1456.49
30	1011.73	1090.52	1073.60	1116.45	1067.57	1103.13	1153.95	1096.80	1117.92	1042.45
31	190.23	201.75	199.36	205.46	181.59	210.92	199.52	202.97	204.63	203.35
32	1996.46	2040.85	2015.51	2041.86	1983.93	2019.62	2131.71	2068.21	2030.12	1977.00
33	903.63	934.84	956.32	941.52	906.52	966.88	1003.73	963.99	971.90	927.09
34	2084.32	2182.48	2142.85	2229.80	2111.45	2189.73	2310.55	2205.55	2209.77	2125.47
35	1128.17	1084.15	1118.97	1142.24	1124.74	1128.12	1189.47	1181.58	1154.95	1110.69
36	279.13	309.68	298.51	326.37	308.73	304.18	306.10	325.43	298.01	307.21
37	1069.74	1095.64	1084.89	1187.74	1068.61	1100.58	1178.54	1146.27	1136.02	1110.38
38	1082.78	1109.53	1116.18	1140.49	1124.90	1153.28	1186.18	1113.21	1146.40	1082.88
39	1392.34	1442.77	1471.24	1492.97	1420.90	1498.96	1521.19	1468.91	1514.56	1421.17
40	2042.56	2108.29	2124.99	2154.51	2077.97	2112.64	2232.25	2114.77	2159.58	2077.86
41	1537.88	1590.39	1569.79	1628.70	1562.60	1610.46	1687.00	1577.22	1620.33	1548.97
42	854.72	857.76	887.97	878.31	871.07	894.45	915.60	874.82	859.40	808.14
43	758.74	792.06	771.76	832.26	768.69	819.73	830.13	829.72	811.34	776.31
44	2049.73	2137.42	2138.83	2189.97	2102.24	2151.14	2257.37	2155.63	2192.74	2094.52
45	472.84	499.94	511.20	494.81	472.71	512.34	507.41	519.99	504.89	466.28
Trip#	TT141	TT142	TT143	TT144	TT145	TT146	TT147	TT148	TT149	TT150
1	1056.74	1095.62	985.91	1008.84	1077.83	1013.21	1025.53	972.32	1038.06	1028.98
2	718.12	735.44	697.54	700.49	737.18	683.39	709.95	717.68	739.02	712.78
3	1505.77	1534.89	1481.68	1465.52	1561.89	1447.29	1455.44	1454.82	1456.11	1465.43
4	2249.95	2300.66	2179.16	2149.86	2261.16	2152.47	2173.17	2167.32	2154.34	2196.66
5	1758.76	1861.75	1718.41	1740.59	1837.79	1759.09	1715.39	1756.60	1741.83	1748.06
6	694.54	729.70	699.20	701.02	727.50	715.72	679.50	654.19	717.40	698.05
7	526.50	533.29	515.51	526.23	531.24	513.34	513.30	563.25	538.45	531.78
8	2102.15	2150.80	2016.10	2013.60	2099.64	2038.34	2003.20	2040.96	2053.14	2057.21
9	1686.97	1756.87	1647.04	1638.74	1723.77	1625.13	1648.81	1628.35	1697.97	1687.96
10	1462.26	1497.04	1406.42	1388.79	1474.88	1398.33	1364.30	1429.30	1399.23	1435.54
11	186.68	199.75	160.01	173.33	184.44	160.40	174.47	158.35	179.89	166.62
12	1504.11	1518.08	1424.18	1434.80	1446.12	1466.41	1462.69	1430.77	1435.38	1466.79
13	2153.77	2219.41	2118.05	2102.31	2199.75	2111.86	2085.02	2115.96	2112.42	2146.06
14	1870.69	1929.54	1834.66	1821.24	1916.15	1837.64	1849.90	1800.12	1848.73	1855.65
15	1743.68	1837.41	1729.77	1724.97	1800.93	1736.24	1706.96	1728.56	1770.35	1792.68
16	846.68	846.86	840.88	798.07	835.96	795.81	790.78	836.34	756.37	812.99
17	2150.08	2236.06	2076.93	2098.85	2206.01	2070.57	2098.30	2098.62	2104.93	2133.03
18	734.48	760.79	704.87	680.25	699.30	703.63	693.52	748.03	686.09	708.25
19	45.00	44.72	35.05	47.32	36.23	35.72	45.32	41.21	46.65	47.71
20	960.92	940.71	922.97	933.68	968.11	952.96	925.34	910.77	919.58	928.81
21	1335.43	1379.97	1278.62	1303.27	1308.82	1289.01	1270.30	1322.21	1309.12	1308.21
22	1268.71	1355.59	1263.42	1288.65	1352.02	1211.99	1245.70	1235.77	1240.45	1253.29
23	403.21	430.37	391.99	414.67	415.29	418.95	392.75	420.44	401.32	421.02
24	2303.05	2353.09	2232.10	2203.58	2312.93	2205.66	2225.43	2221.11	2205.38	2247.70
25	188.07	154.72	148.75	166.97	191.17	178.94	172.82	156.15	169.52	173.36
26	587.99	576.43	571.46	575.68	602.87	571.40	580.53	575.38	585.73	586.07
27	451.47	491.80	458.48	446.35	486.64	461.22	460.47	451.23	422.34	432.97
28	1067.06	1105.62	1081.69	1068.57	1082.36	1062.35	1040.75	1056.72	1071.05	1037.55
29	1506.29	1576.29	1485.53	1475.75	1533.55	1464.64	1477.83	1488.05	1516.61	1544.64

30	1131.37	1154.25	1081.60	1050.26	1087.31	1094.85	1078.93	1061.45	1079.62	1127.16
31	182.67	189.30	190.20	188.34	201.80	202.74	180.26	211.77	205.72	196.20
32	2085.64	2133.92	2005.55	2019.68	2126.93	2003.30	2019.87	2044.54	2019.93	2058.14
33	938.45	1001.66	935.43	878.63	968.48	939.67	905.49	910.50	922.52	956.37
34	2222.90	2280.05	2139.53	2143.07	2246.54	2173.23	2140.16	2150.76	2151.02	2190.80
35	1175.14	1210.11	1138.04	1135.58	1217.51	1091.26	1165.01	1157.09	1143.47	1160.62
36	323.86	318.05	289.16	275.58	301.61	316.51	315.06	294.96	326.71	342.62
37	1162.40	1166.49	1111.11	1120.06	1155.13	1126.44	1149.93	1127.05	1127.25	1149.23
38	1177.01	1183.64	1106.61	1065.83	1165.82	1148.34	1107.90	1094.63	1118.74	1133.96
39	1469.01	1517.05	1472.13	1468.66	1563.35	1465.04	1421.35	1447.39	1484.82	1486.38
40	2168.89	2213.57	2110.90	2093.32	2177.12	2088.71	2103.54	2089.11	2096.69	2148.40
41	1659.56	1663.20	1556.14	1542.76	1644.78	1588.61	1578.63	1541.76	1555.93	1574.76
42	880.53	908.68	841.19	886.45	902.15	851.24	873.72	884.79	883.85	904.19
43	816.17	851.82	800.08	816.42	819.20	796.27	800.42	836.55	807.09	833.41
44	2202.86	2252.91	2142.61	2123.42	2204.54	2131.51	2114.87	2123.04	2122.90	2160.16
45	523.00	547.06	510.81	472.21	554.57	494.67	483.94	512.35	498.65	486.09

APPENDIX H

APPLICATION TRIP ITINERARY DATA

Trip#	TT1	TT2	TT3	TT4	TT5	TT6	TT7	TT8	TT9	TT10
1	115.30	113.90	106.90	113.50	115.30	114.10	111.70	114.30	112.60	112.30
2	53.60	55.60	55.40	54.60	55.60	56.10	53.40	54.00	53.40	53.80
3	122.00	125.00	120.30	120.50	124.20	125.60	119.80	124.00	125.20	120.40
4	193.10	190.10	195.40	189.50	193.50	193.50	186.30	183.30	188.60	184.60
5	129.20	136.20	130.10	130.70	125.40	131.90	127.60	131.40	127.90	131.50
6	130.70	132.10	136.60	141.60	143.00	138.20	138.70	137.90	144.30	137.30
7	42.80	44.30	43.50	44.70	43.10	43.10	43.20	44.00	43.00	44.40
8	70.90	72.50	73.00	71.00	74.10	73.60	70.50	74.70	72.10	71.90
9	43.50	41.80	42.80	44.40	43.80	45.00	44.50	44.30	45.60	43.70
10	84.80	86.70	87.00	88.20	85.90	87.90	86.20	87.20	88.80	88.50
11	82.50	84.70	84.90	82.70	86.20	84.40	81.70	86.80	85.10	83.60
12	21.60	21.60	22.00	22.00	21.30	21.90	21.60	22.90	21.60	22.00
13	198.90	198.20	204.80	214.60	214.30	214.00	208.10	208.80	222.60	208.50
14	107.60	106.90	104.20	110.30	108.00	107.90	107.60	108.50	113.20	109.00
15	84.00	82.30	84.40	85.80	85.20	84.70	84.60	84.70	83.50	87.40
	TT11	TT12	TT13	TT14	TT15	TT16	TT17	TT18	TT19	TT20
1	111.30	111.20	110.70	109.50	111.80	113.60	115.50	112.70	110.30	116.20
2	54.60	53.30	53.90	54.80	54.50	54.50	53.50	54.30	53.20	53.80
3	124.30	119.60	126.30	123.60	124.10	123.00	121.30	124.30	123.70	120.80
4	204.70	177.70	194.20	189.00	199.50	188.80	197.90	197.50	187.10	195.10
5	130.50	129.20	131.10	129.70	130.70	128.80	131.20	132.90	132.30	131.60
6	141.50	140.00	137.40	141.20	140.40	134.60	145.80	141.20	140.40	138.20
7	42.90	44.10	44.40	44.30	43.30	44.60	45.50	44.00	44.00	43.00
8	71.80	72.40	73.10	70.30	72.90	72.10	73.90	73.90	72.50	71.30
9	44.10	44.40	44.10	44.00	43.70	43.00	43.60	42.50	45.30	44.50
10	88.60	86.50	87.20	89.50	88.80	86.40	89.60	91.00	88.80	88.20
11	82.80	84.60	85.20	83.10	83.30	82.40	86.80	86.70	85.50	84.70
12	22.40	21.10	21.90	21.10	22.10	22.40	22.80	21.90	21.20	22.70
13	213.00	213.90	211.80	210.00	213.40	203.20	221.00	212.10	210.60	210.00
14	109.60	108.40	106.60	105.60	108.70	104.50	107.30	109.00	109.60	104.30
15	82.10	83.60	85.30	83.70	83.70	83.50	85.80	83.70	83.10	84.50
	TT21	TT22	TT23	TT24	TT25	TT26	TT27	TT28	TT29	TT30
1	111.30	114.60	112.60	113.00	115.20	111.30	113.00	112.70	108.80	112.90
2	54.00	54.20	55.40	54.50	54.60	54.80	54.50	54.40	53.60	55.20
3	125.80	123.80	121.20	124.60	128.00	125.10	122.00	126.70	124.70	121.70
4	192.40	187.00	187.20	181.30	195.20	190.30	191.30	197.30	193.40	193.10
5	131.20	133.80	126.60	132.30	137.50	128.00	130.60	132.00	132.30	133.70
6	142.40	138.80	133.50	139.30	135.60	139.00	141.00	142.20	138.40	141.70
7	45.00	44.40	43.70	43.90	45.90	43.80	45.10	44.00	42.80	43.40
8	74.90	73.60	72.50	74.80	72.00	73.80	72.40	74.80	75.30	72.80
9	43.00	44.70	43.40	43.00	44.60	44.20	45.30	43.60	43.20	42.80
10	88.30	88.20	83.60	89.50	88.10	86.70	88.20	90.10	87.60	89.20
11	88.10	85.00	83.10	84.90	85.30	85.60	83.00	87.10	86.50	85.20
12	22.70	21.80	22.90	22.20	22.40	22.30	23.30	22.30	22.40	22.30
13	214.90	211.60	203.60	213.50	206.20	210.10	213.80	211.60	210.00	214.80
14	111.50	105.40	106.10	106.30	109.90	106.10	110.10	106.70	108.80	104.10
15	85.10	84.00	84.60	87.80	85.80	85.30	86.60	85.90	84.40	85.30
	TT31	TT32	TT33	TT34	TT35	TT36	TT37	TT38	TT39	
1	113.50	109.80	115.90	111.90	110.40	109.50	109.90	112.80	114.20	
2	54.80	53.00	53.50	54.60	54.60	53.30	52.20	53.10	53.90	
3	126.00	122.50	119.80	118.80	119.20	125.20	122.40	125.20	122.70	
4	198.00	198.00	187.00	176.70	186.20	193.80	191.80	193.90	189.70	
5	130.90	133.30	132.30	129.90	131.50	133.60	133.20	132.00	127.80	
6	138.30	140.00	138.00	139.70	134.80	139.60	138.50	138.70	136.10	
7	43.60	45.00	45.10	43.50	45.50	44.60	45.90	45.20	44.40	
8	73.60	72.60	77.00	74.40	73.90	75.30	72.80	74.30	72.80	
9	44.00	43.40	43.60	43.30	43.70	44.20	41.60	43.40	44.30	
10	88.10	88.40	88.70	87.00	86.20	89.10	90.30	91.50	87.60	
11	86.40	82.20	88.00	83.40	87.40	84.10	85.60	86.70	87.00	

12	23.50	28.80	22.80	22.80	22.60	28.20	31.60	23.80	23.40
13	210.10	212.40	208.50	211.30	204.30	211.50	210.80	210.70	206.50
14	107.70	107.00	103.50	108.60	106.70	110.10	104.70	107.60	106.30
15	83.50	85.60	86.50	88.10	85.80	84.10	85.60	85.20	86.80