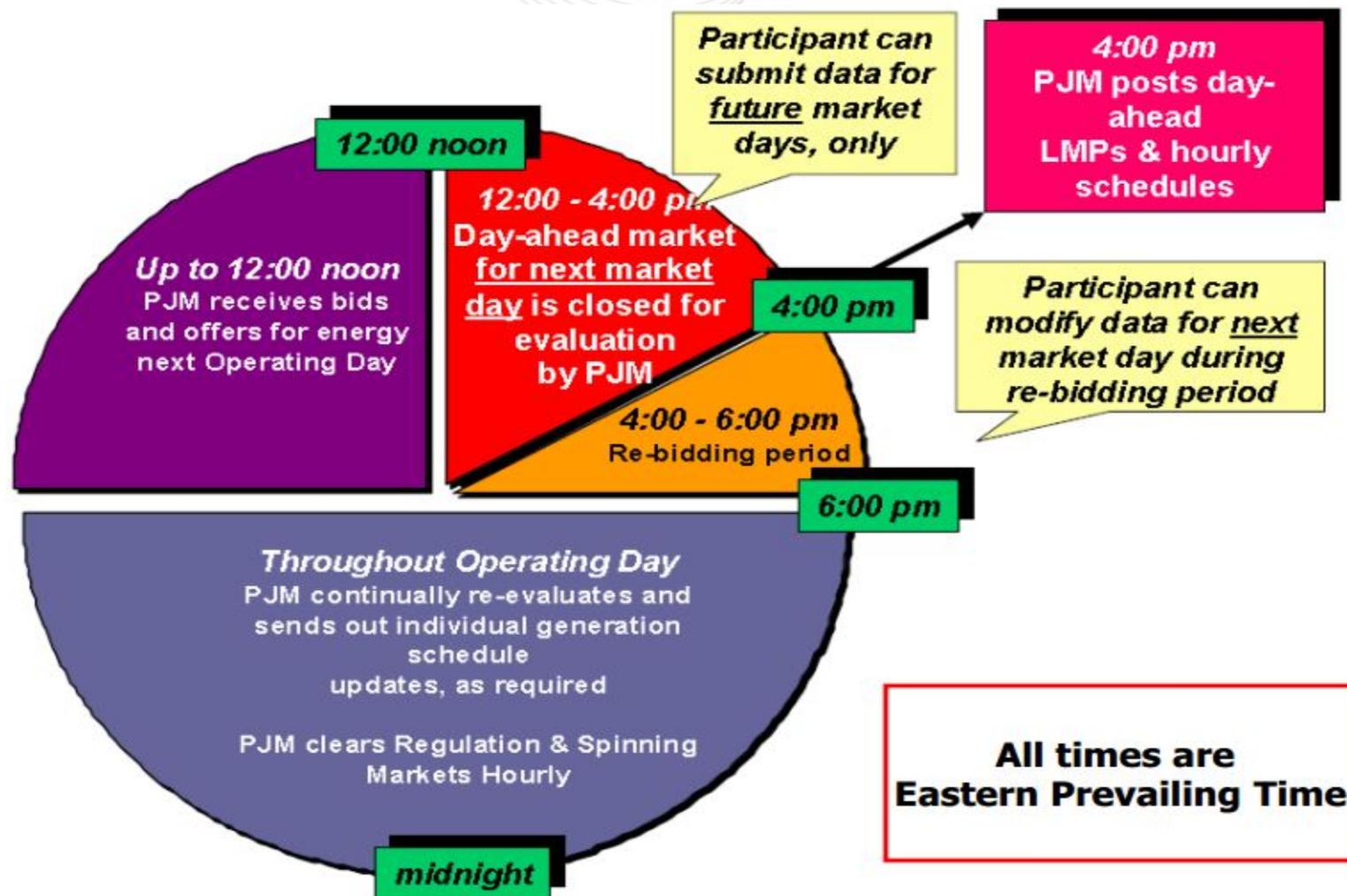


Day Ahead Market Clearing Process

05/08/2014

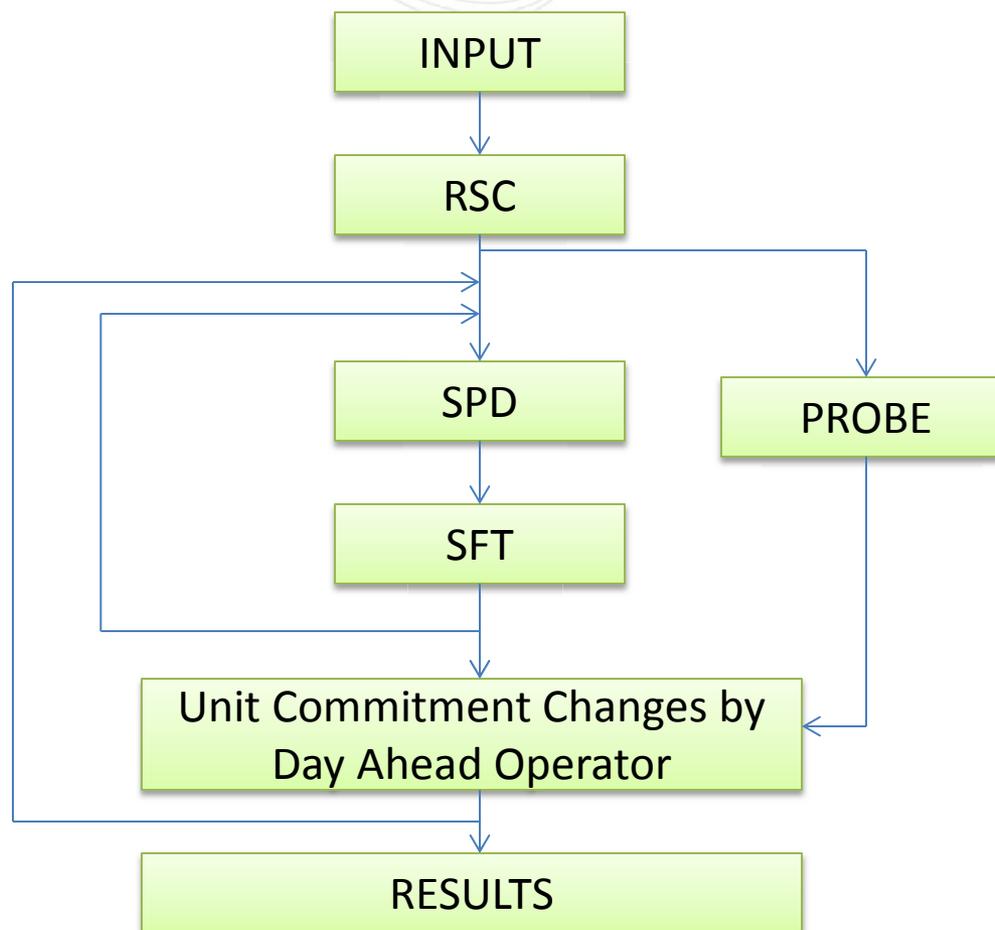
Day Ahead Market Time Line



Prior to DAM Closes

- Reliability Engineer Provides following to DAM Operator
 - Study Contingencies
 - Schedule Outages
 - Reliability units
 - Reactive Interface Limits

Day Ahead Market Clearing Process



After Day Ahead Market Close

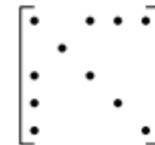
- Resource Scheduling Commitment (RSC)
 - Major Transfer Constraints
 - No up-to congestion transactions
 - Includes increment and decrement bids
 - Unit Commitment only
- Scheduling Pricing and Dispatch (SPD)
 - All Constraints
 - up-to congestion transactions

After Day Ahead Market Close (Cont.)

- PROBE
 - Provide recommendation to DAM engineer to commit, de-commit or modify unit commitment using all constraints to determine least cost solution
 - Three pivotal supplier test

Why Bid Volume is a problem

- The solution time for an optimization problem depends on:
 - objective and constraint function
 - number of control variables and constraints
 - structure of matrix (such as sparse, structured, dense)
- A problem is sparse if each constraint function depends on only a small no. of variables
 - A sparse matrix has enough zeros that it is worth taking advantage of them



Why Bid Volume is a problem (cont.)

- A structured matrix has enough structure that it is worthwhile to use it

$$\begin{bmatrix} a & b & c & d & e \\ b & a & b & c & d \\ c & b & a & b & c \\ d & c & b & a & b \\ e & d & c & b & a \end{bmatrix}$$

- A dense matrix is neither sparse nor structured

$$\begin{bmatrix} \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \end{bmatrix}$$

- Dense matrix requires large memory and takes long time to perform mathematical operations

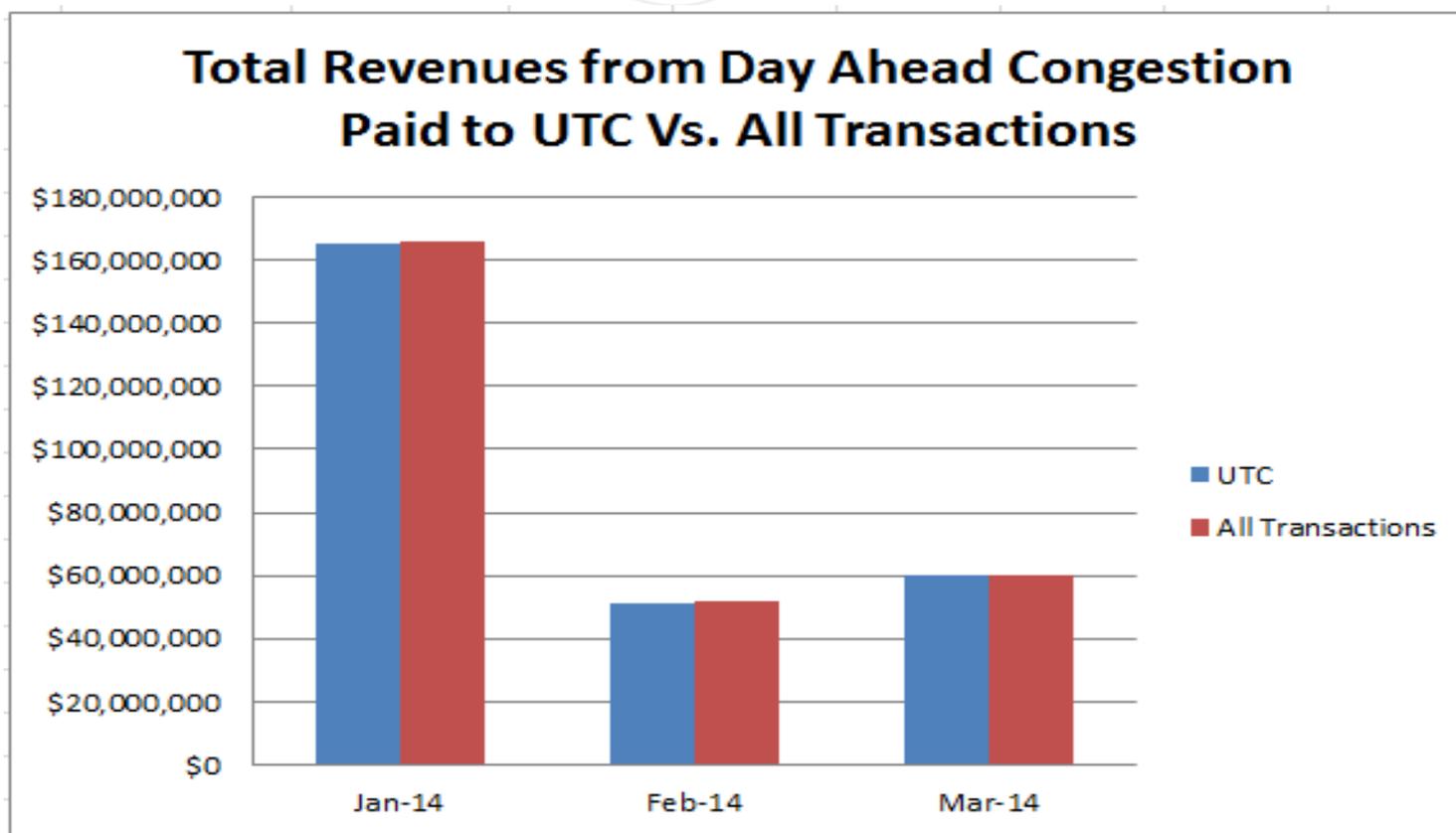
How to find eliminated paths because of
+/- \$50 UTC bid price cap

Elimination of UTC paths due to +/- \$50 bid cap

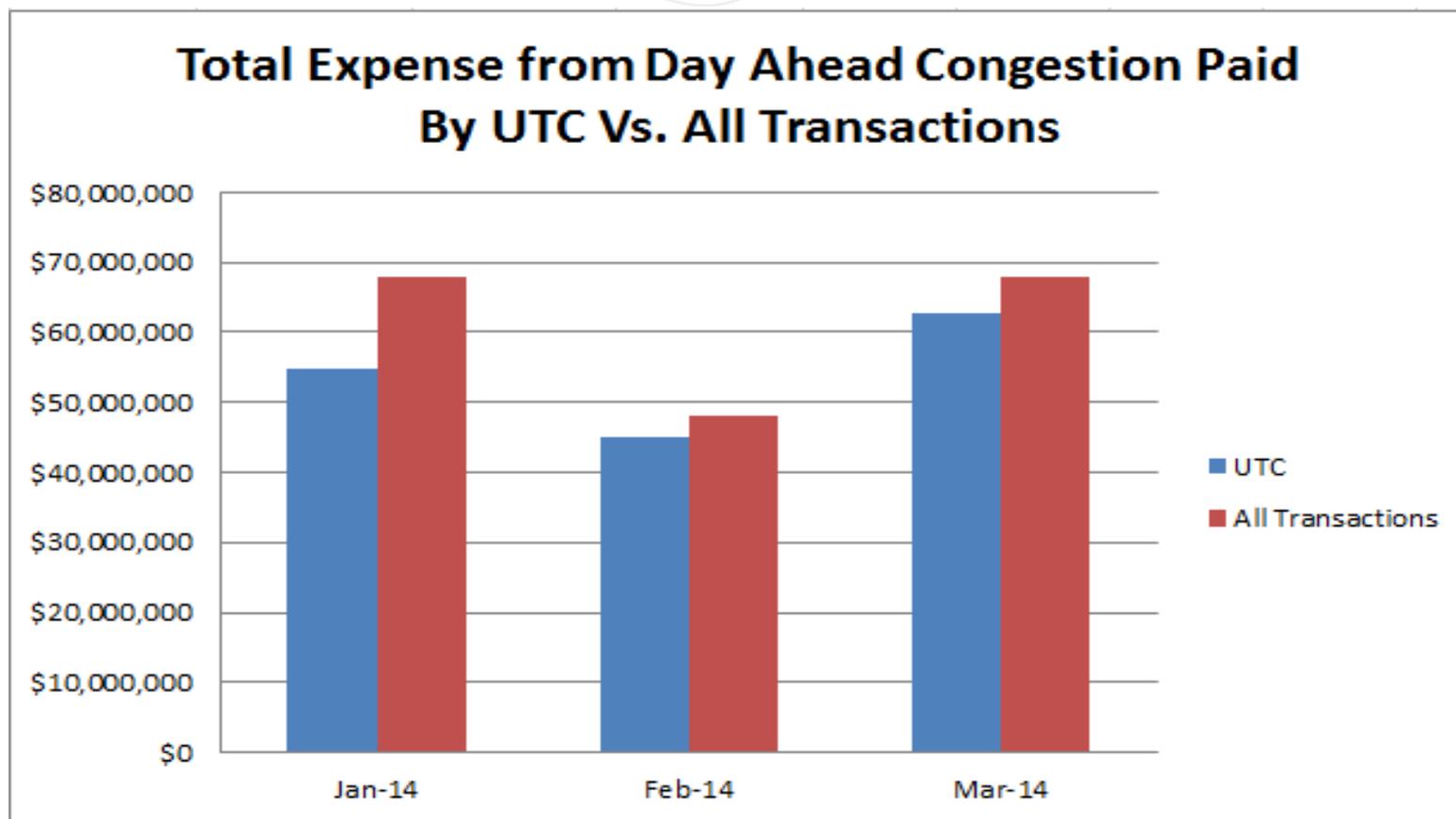
- LMPs are posted at <http://www.pjm.com/markets-and-operations/energy/day-ahead/Impda.aspx>
- For any path if the difference in LMP between the path is greater than \$50 then that path is eliminated

Information about Revenue and Expense of Congestion and Marginal Loss From Day Ahead and Real-Time Market

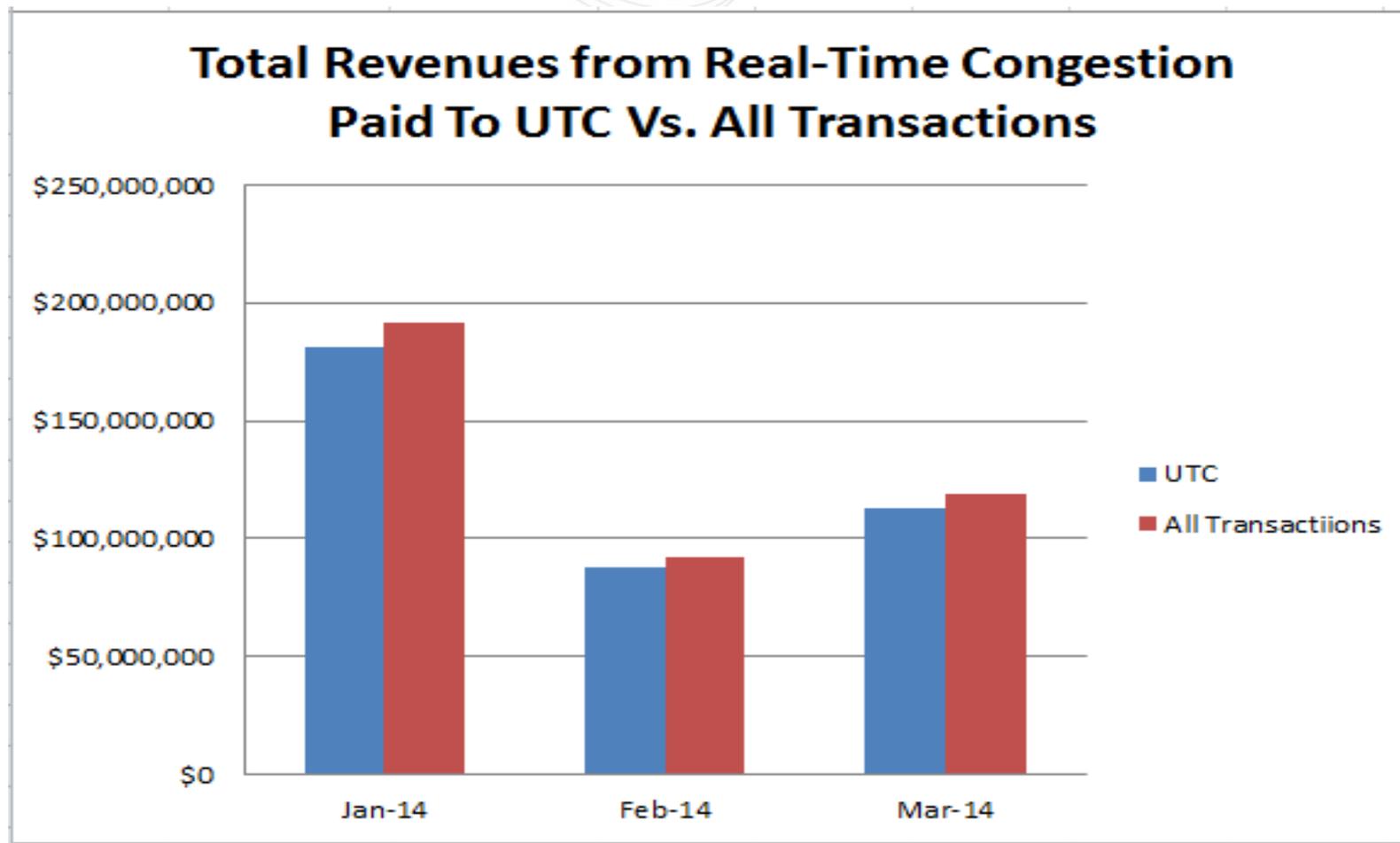
Congestion and Marginal Loss Data



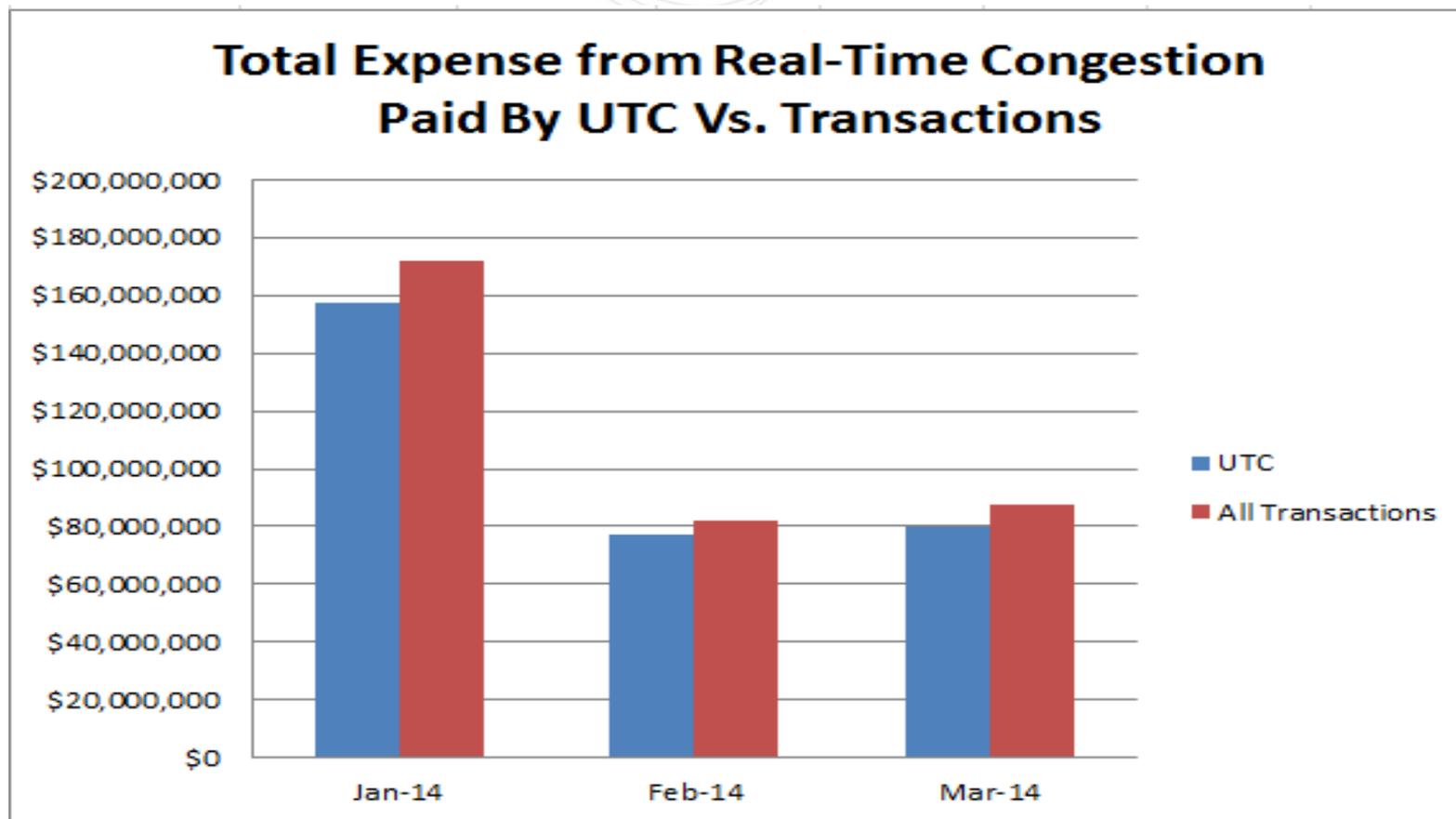
Congestion and Marginal Loss Data (Cont.)



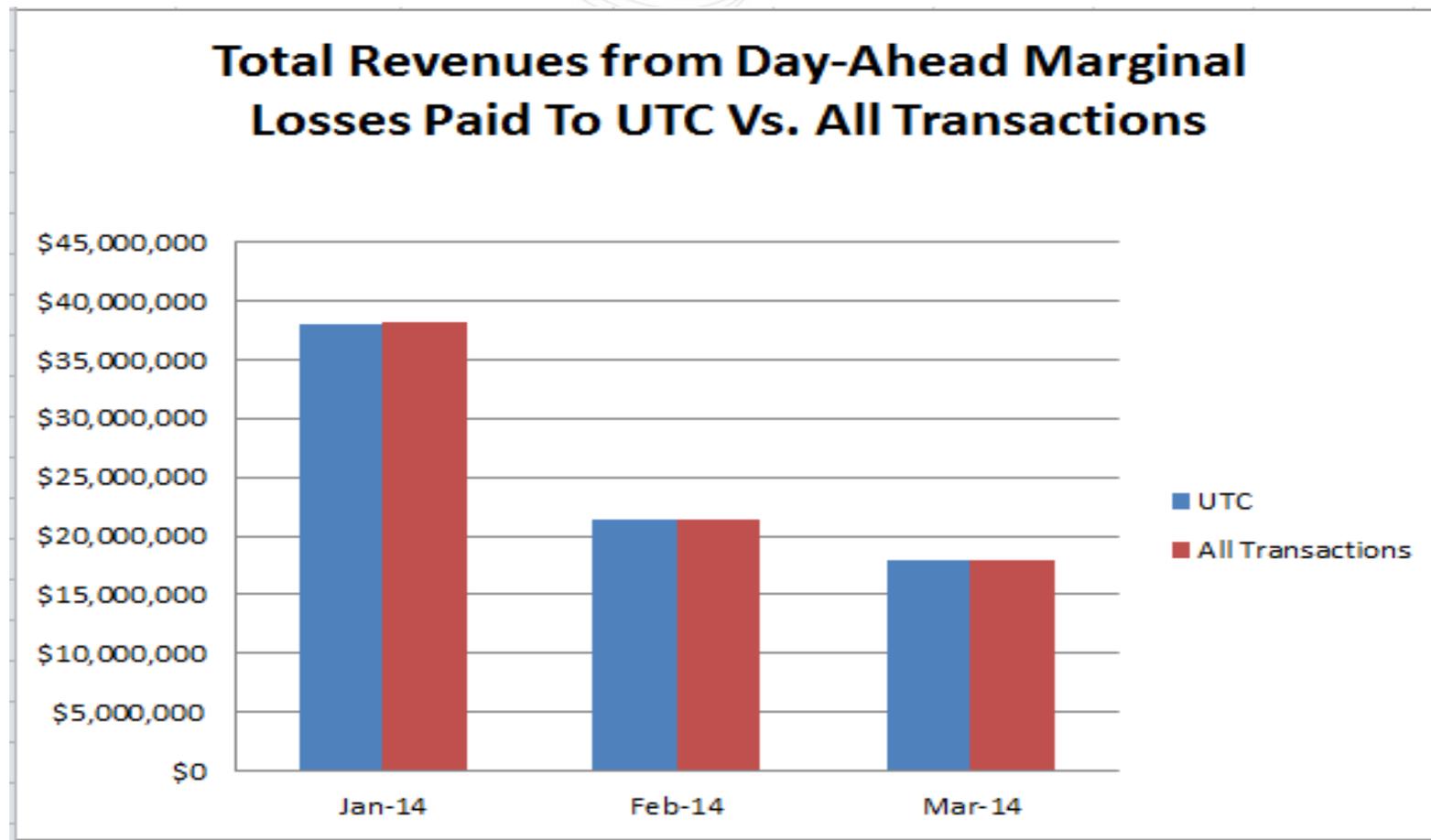
Congestion and Marginal Loss Data (Cont.)



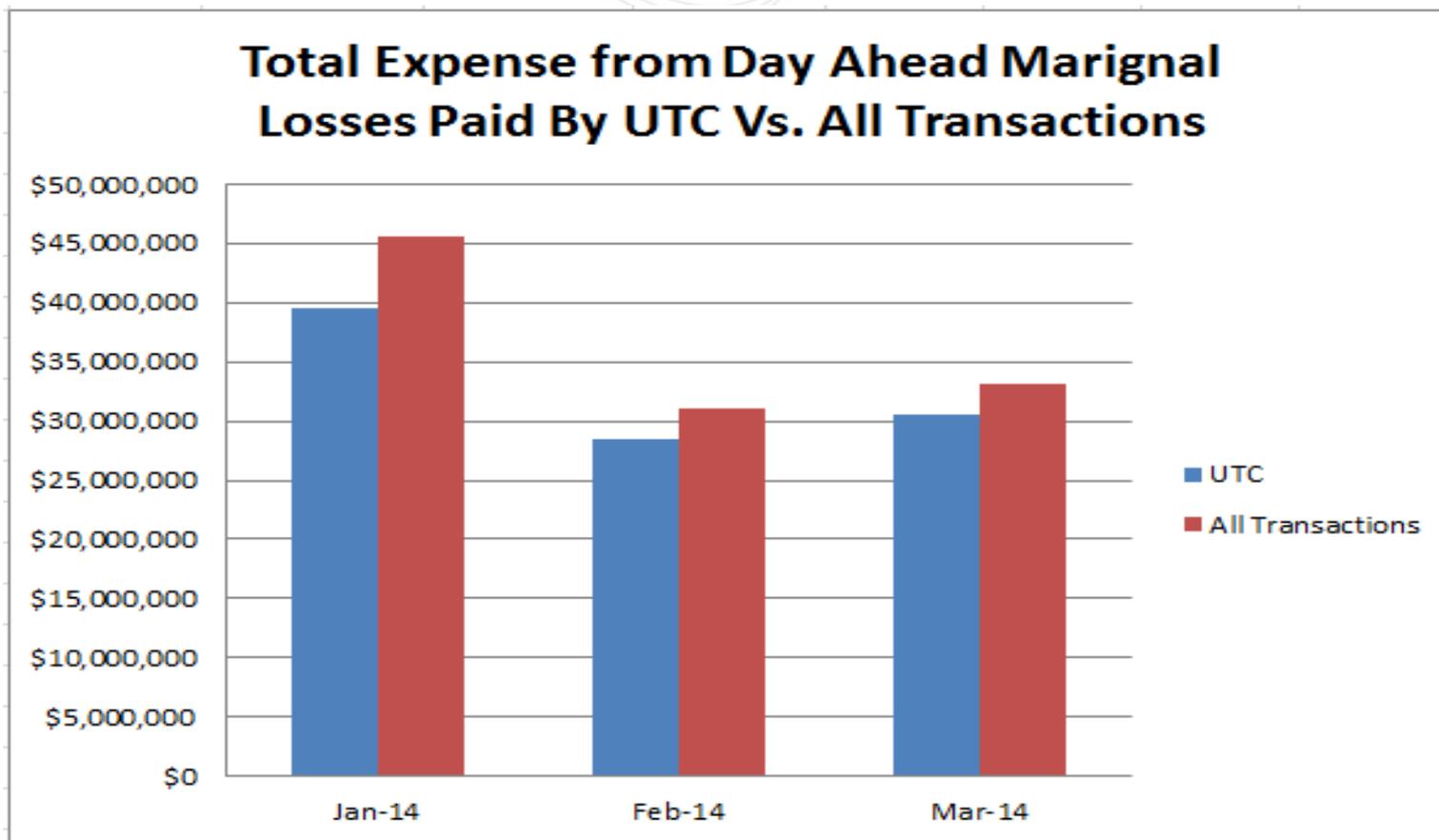
Congestion and Marginal Loss Data (Cont.)



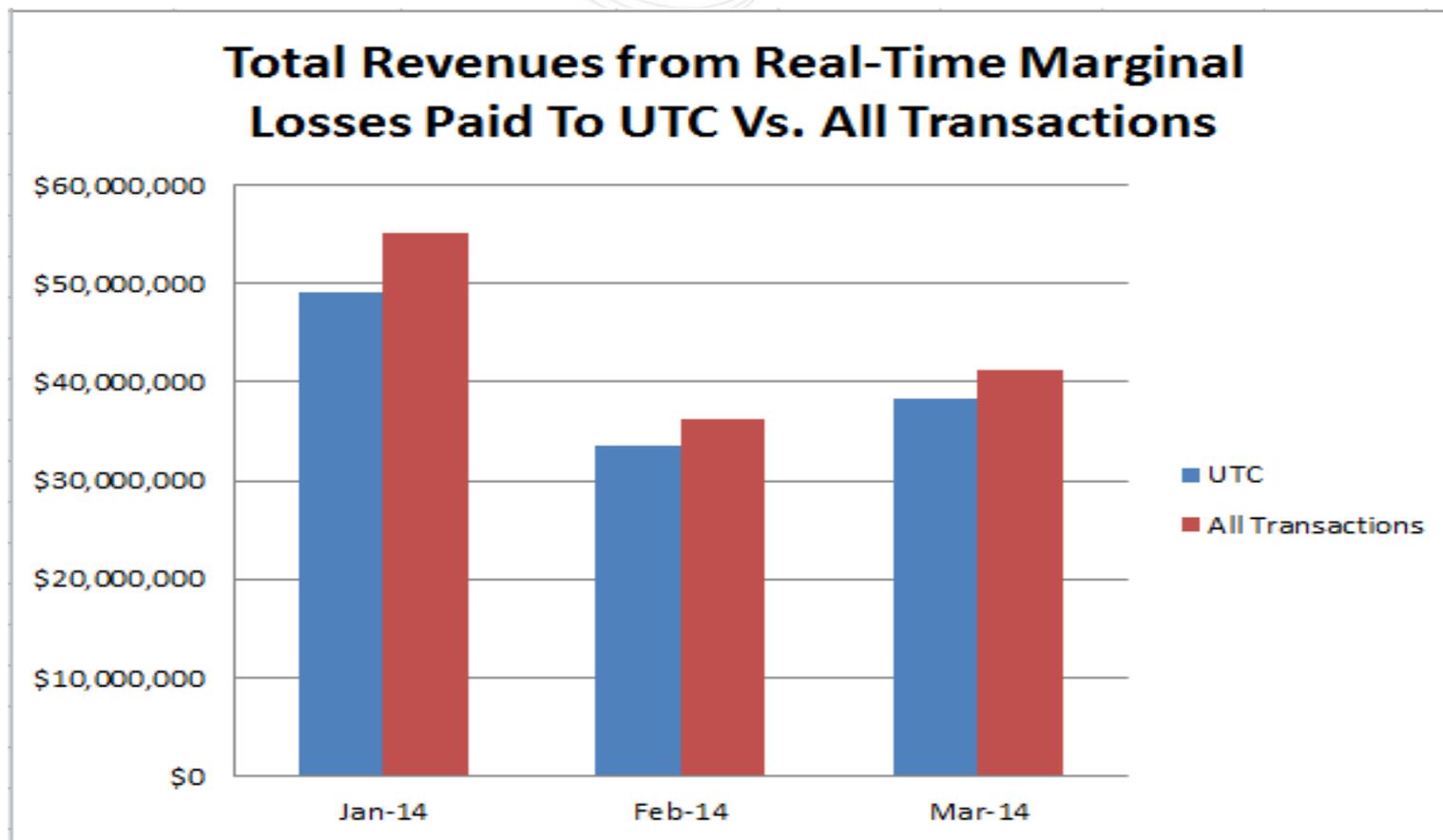
Congestion and Marginal Loss Data (Cont.)



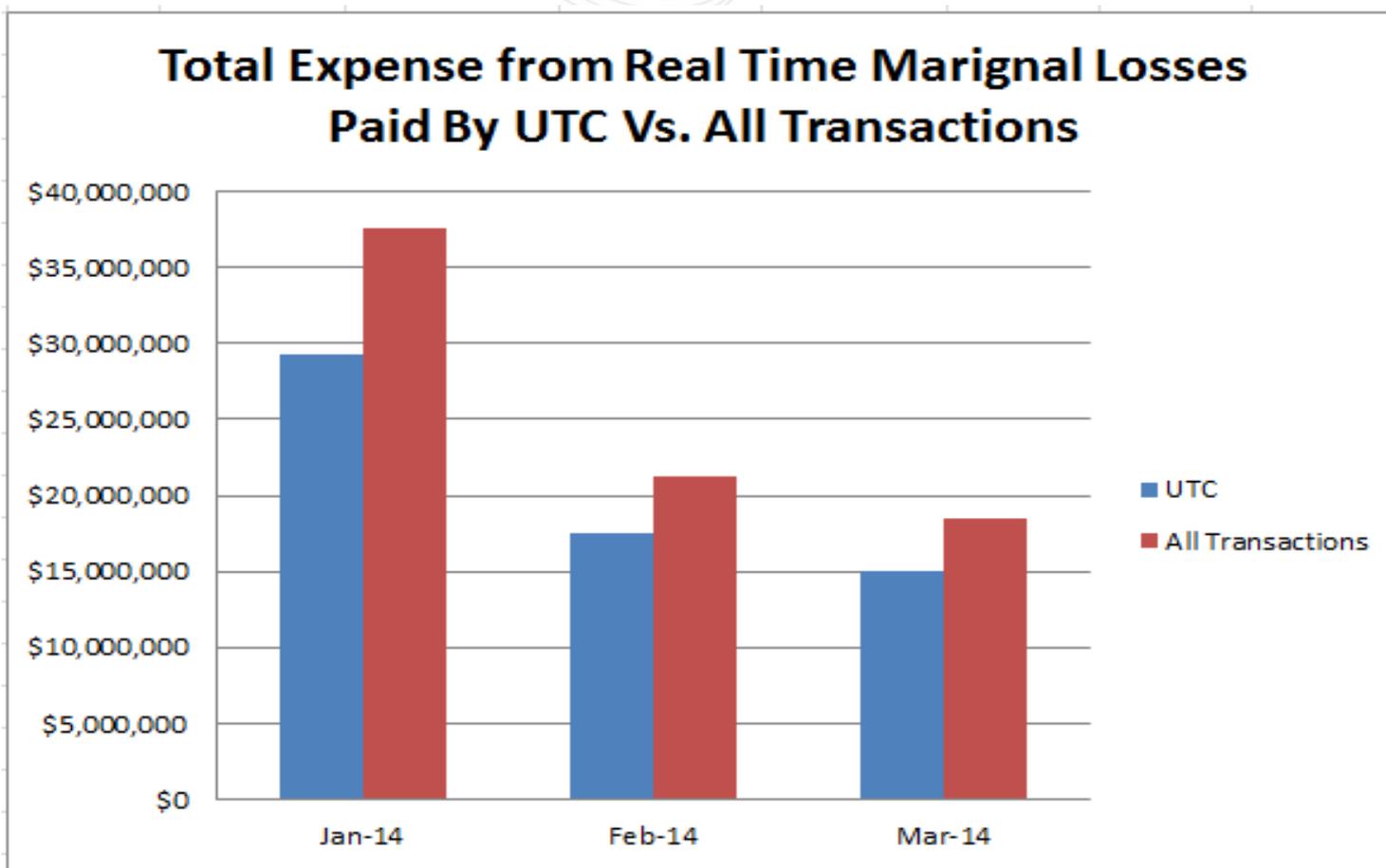
Congestion and Marginal Loss Data (Cont.)



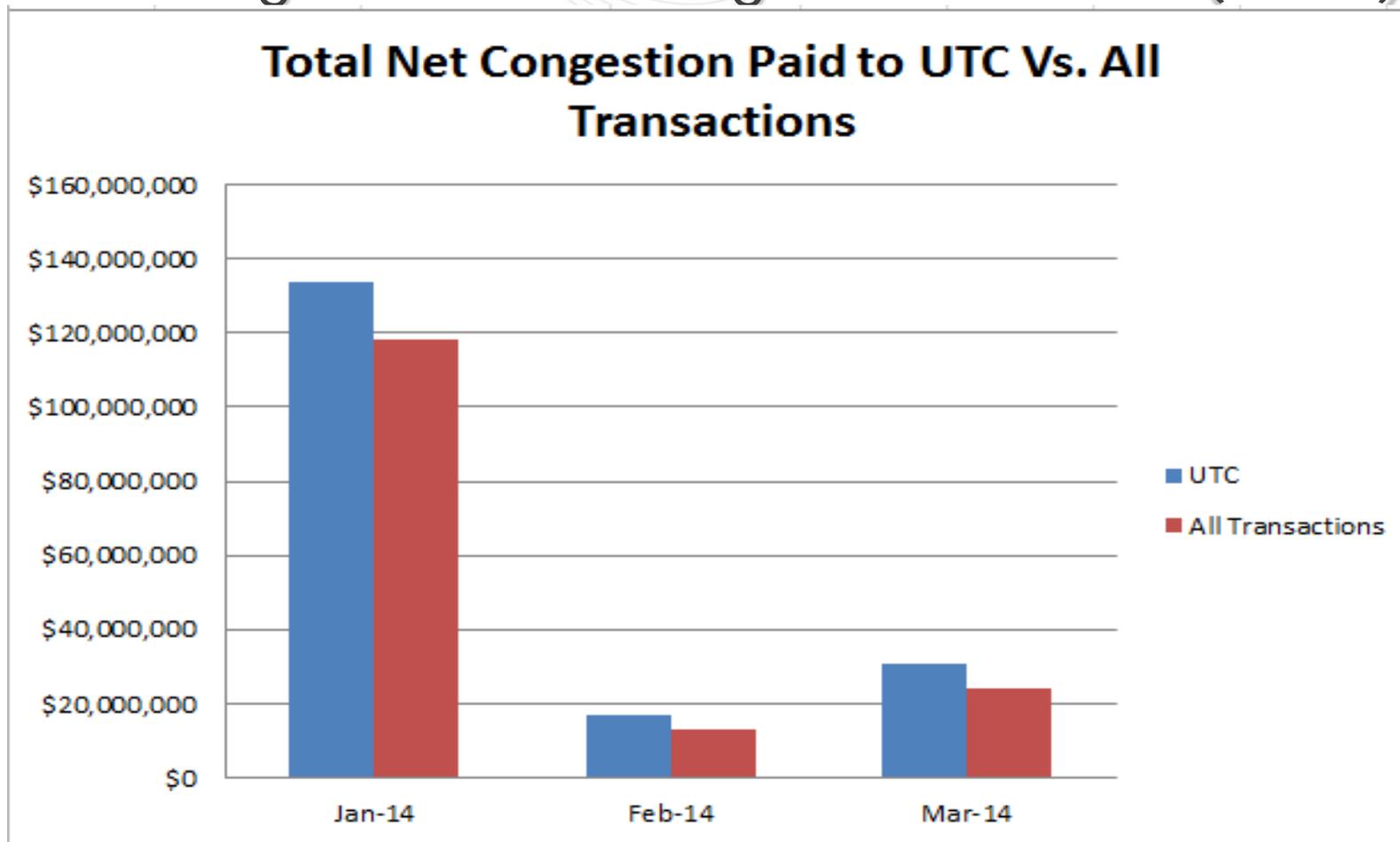
Congestion and Marginal Loss Data (Cont.)



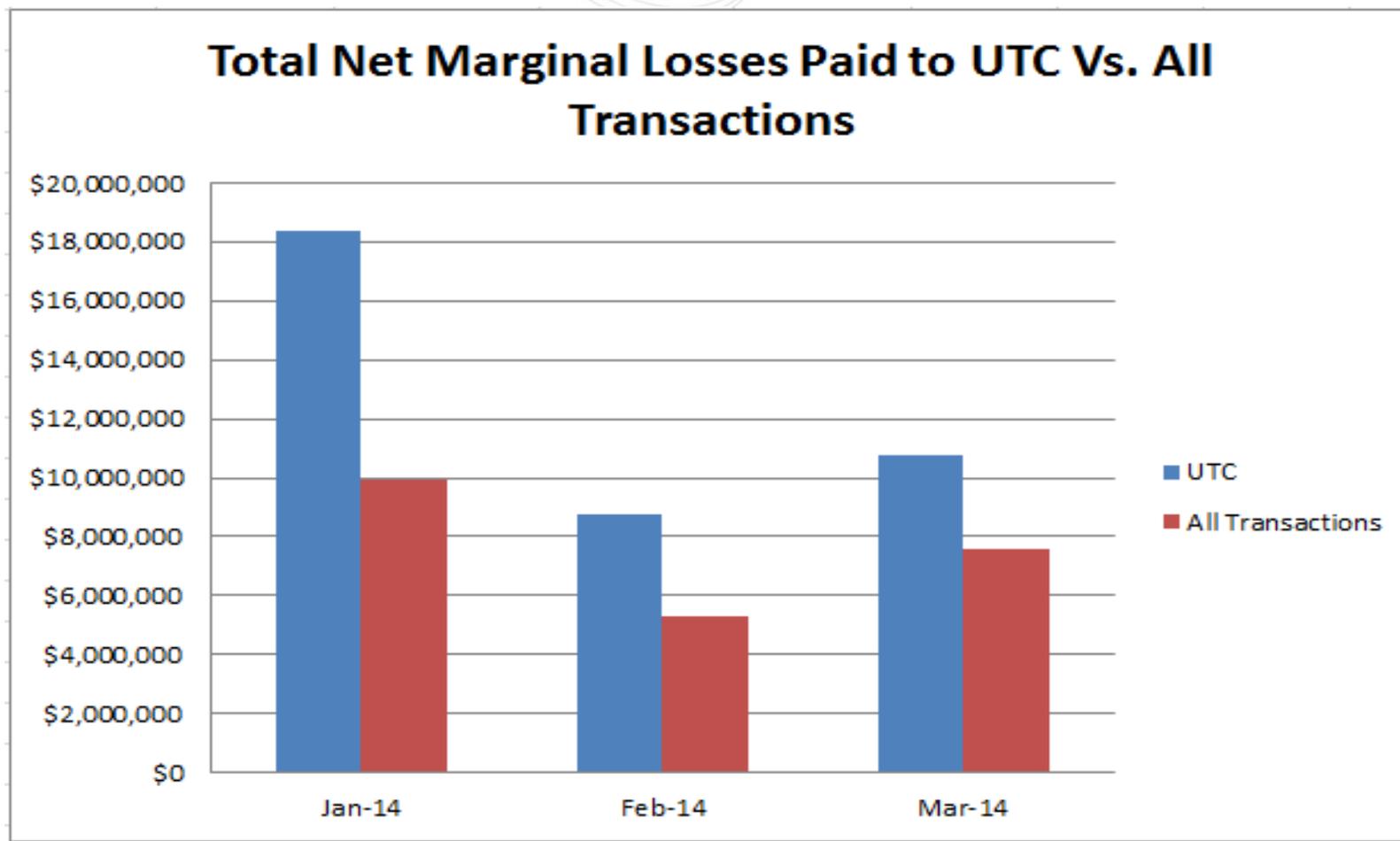
Congestion and Marginal Loss Data (Cont.)



Congestion and Marginal Loss Data (Cont.)



Congestion and Marginal Loss Data (Cont.)



Questions?