



Joint WMIC & RT0 West Seams Workshop Congestion Management

June 21, 2000

Salt Lake City



Congestion management 'at the Seams'

- How will congestion be managed across the external interfaces that connect RTO West to the CaISO, Desert Star, Rocky Mountain RTO and Canada ?
- How will congestion be managed across the internal interfaces that connect RTO West to non-participating entities ?



The Congestion Management Workgroup (CMW) is considering two congestion management models:

- **The ‘Physical Model’ requires firm transmission rights in order to schedule. These rights are limited to the ATC of the path and auctioned by the RTO. This model is currently favored by most members of the CMW**

- **The ‘Financial Model’, which is still being considered is an “accept all schedule” approach in which the RTO operates two markets:**

- 1) A day-ahead and hour-ahead forward forward re-dispatch market that clears congestion.**

- 2) A forward Firm Transmission Rights (FTR) market for financial rights that hedge congestion cost risk.**

Example: Financial Model

Owner of 'Dec' resource pays
RTO 30 mills to decrease
output by 20 mw

RTO pays owner of 'Inc'
resource 40 mills to increase
output by 20 mw



Inc-Dec Market:

- RTO charges all schedules \$10/mwh:

$$\text{RTO congestion revenue} = 120\text{mwh} \times \$10/\text{mwh} = + \$ 1,200/\text{hr}$$

- 20 mwh re-dispatch costs RTO \$10/mwh more than it collects

$$\text{RTO re-dispatch costs} = 20\text{mwh} \times \$10/\text{mwh} = - \$ 200/\text{hr}$$

$$\text{RTO net revenue} = + \$ 1,000/\text{hr}$$

- RTO pays owners of FTRs \$10/mw/hr (= \$1,000/hr/100mw) = - \$ 1,000/hr

$$\text{RTO net congestion revenue} = \$ 000/\text{hr}$$

FTR Auction Market

- RTO auctions 100 mws FTRs for an expected value of \$10/mw/hr = + \$ 1,000/hr

Example: Physical Model



- **Expected market value of physical FTRs equals avoided incremental cost**
- **Avoided incremental cost = \$10/mw/hr**
- **RTO auctions 100 mws FTRs at their expected market value**

FTR Auction Market

- **RTO auction revenue = 100mw x \$10/mw/hr = \$ 1,000/hr**

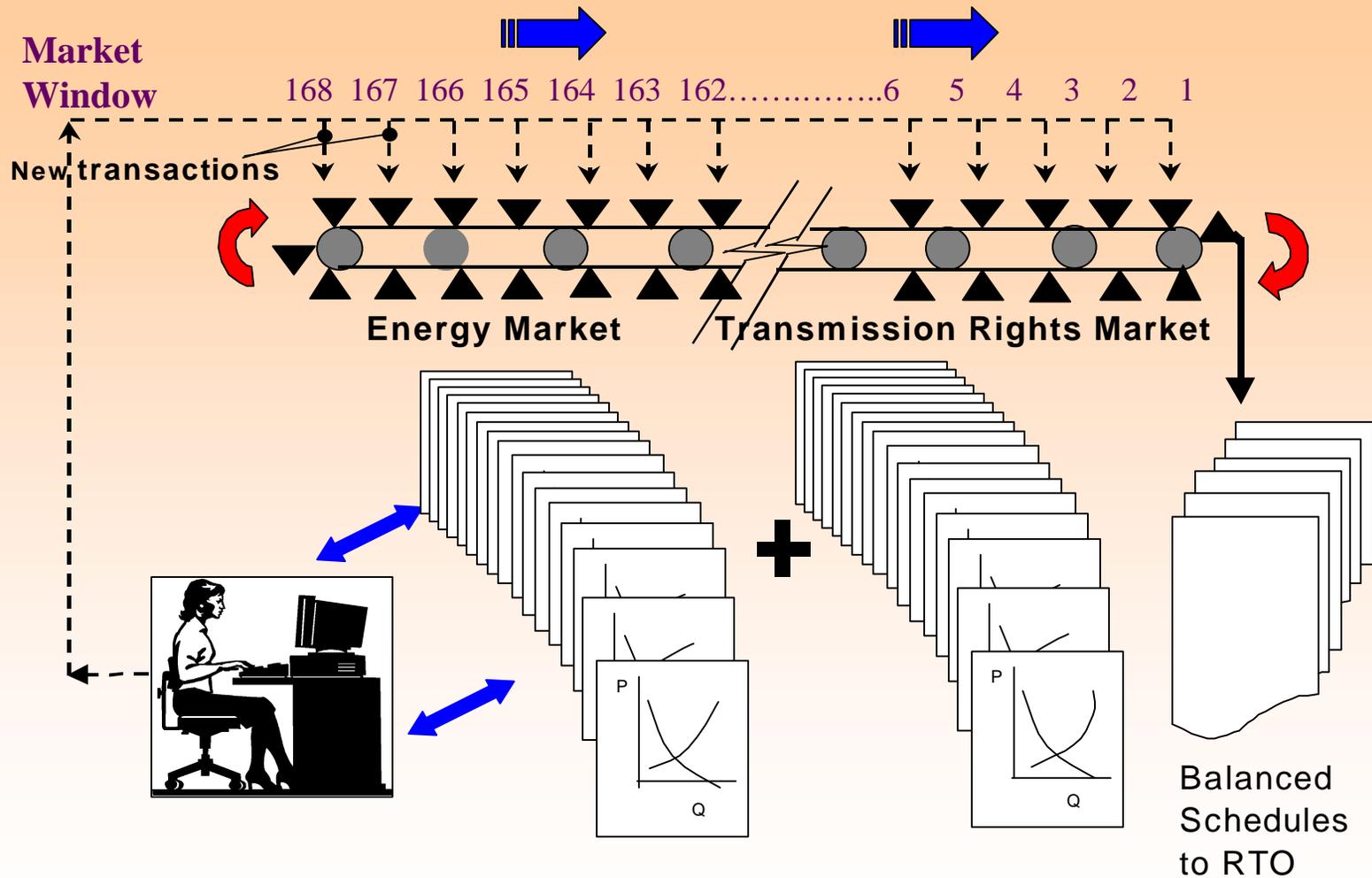
So why is the CMW leaning towards the Physical Model ?

- Physical Model resolves congestion with minimal RTO involvement in re-dispatch.
- The Physical Model does not require a coordinated inter-RTO inc-dec market to resolve congestion across a seam.
- Requires one market instead of two.
-(discussion)
- *However, the physical model will require an efficient forward and continuous market in which to trade these rights otherwise the grid will be underutilized.*

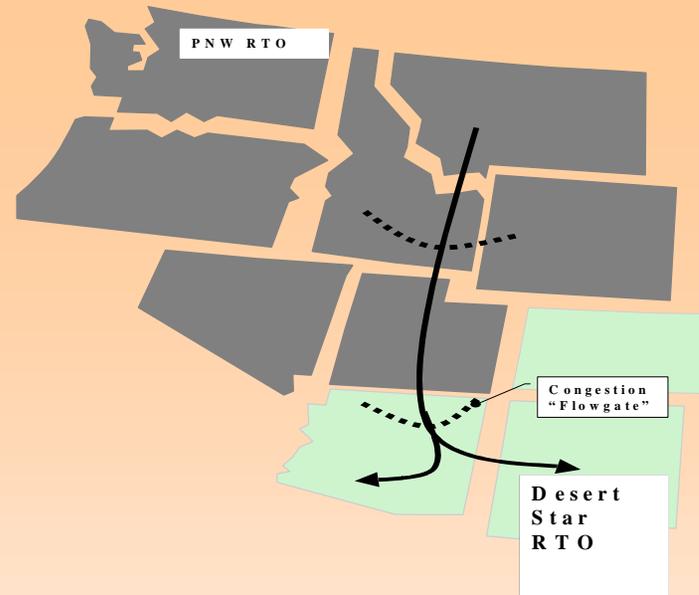
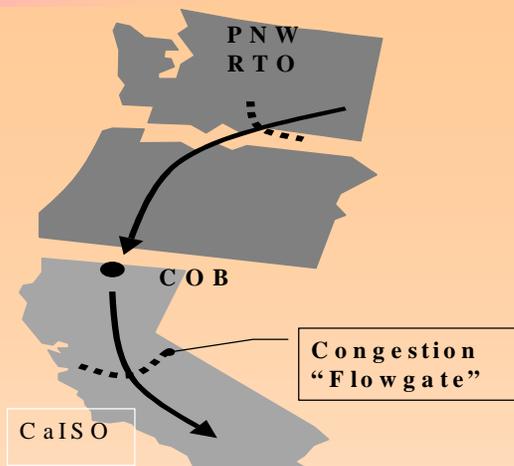
So how does a continuous markets work ?.....

Continuous Market in Energy & Transmission Rights

Trading Window Conveyor Belt (Velocity = 1 bucket/hour)



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What are some possible congestion management solutions at the seams ?

Option A: RTO West Financial model + CaISO Financial model

Option B: RTO West Physical model + CaISO Financial model

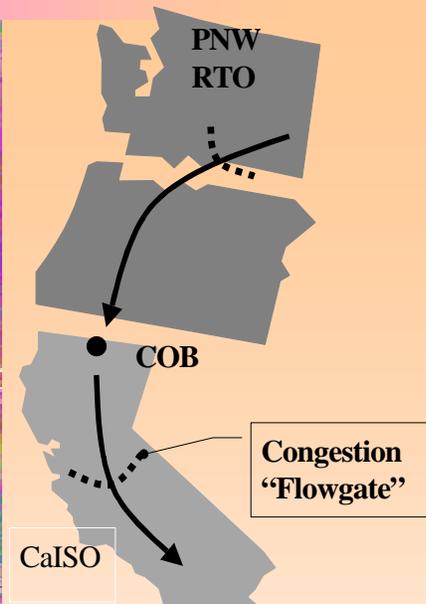
Option B': RTO West Financial model + DSTAR Physical model

Option C: RTO West Physical model + DSTAR Physical model

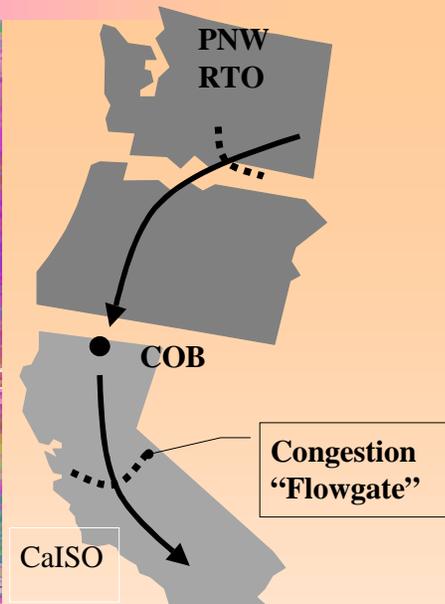
Example: Option A

RTO West - Financial Model

CaISO - Financial Model



- Which RTO will manage congestion across COB ?
- Will the inc/dec market be managed by one RTO ?
- Will the managing RTO share congestion revenues ?

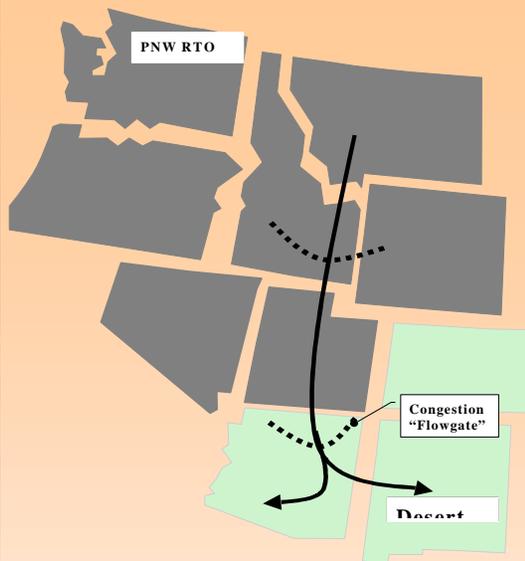


Example: Options B&B'

RTO West - Physical Model

CaISO - Financial Model

- Which RTO will manage congestion across COB ?
- Which methodology will manage congestion ?
- Which methodology is easier to implement ?
- How will congestion revenues be shared ?

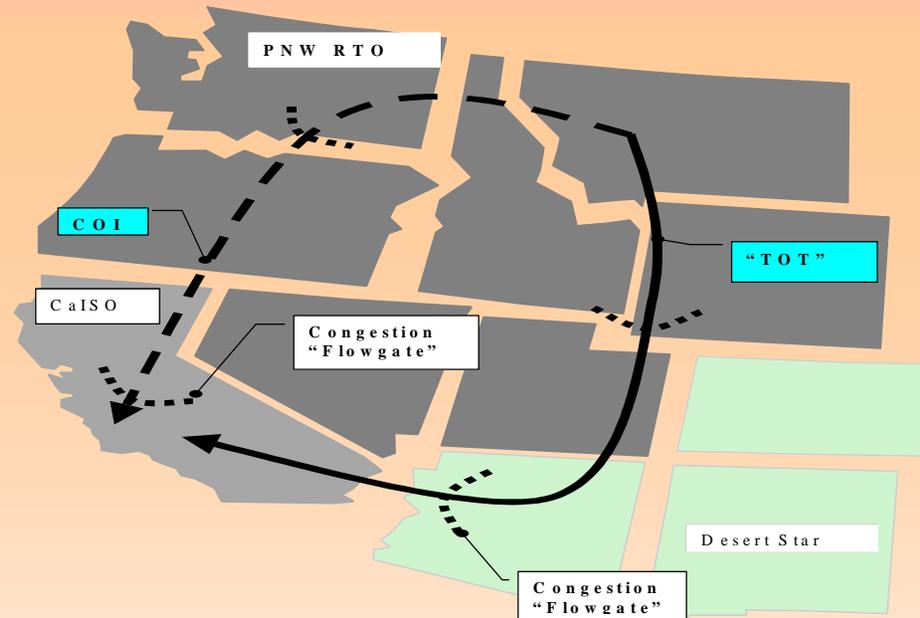


Example: Option C

RTO West - Physical Model

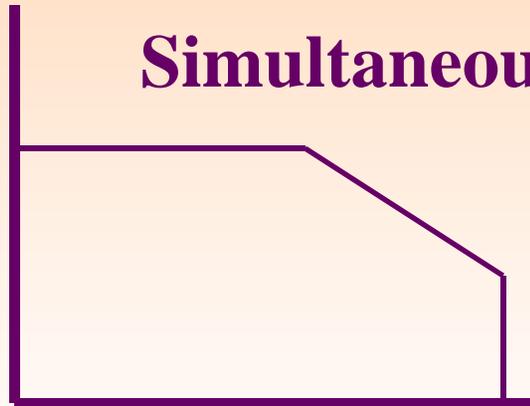
DSTAR - Physical Model

- Which RTO will manage congestion at interface ?
- How will congestion revenues be shared ?



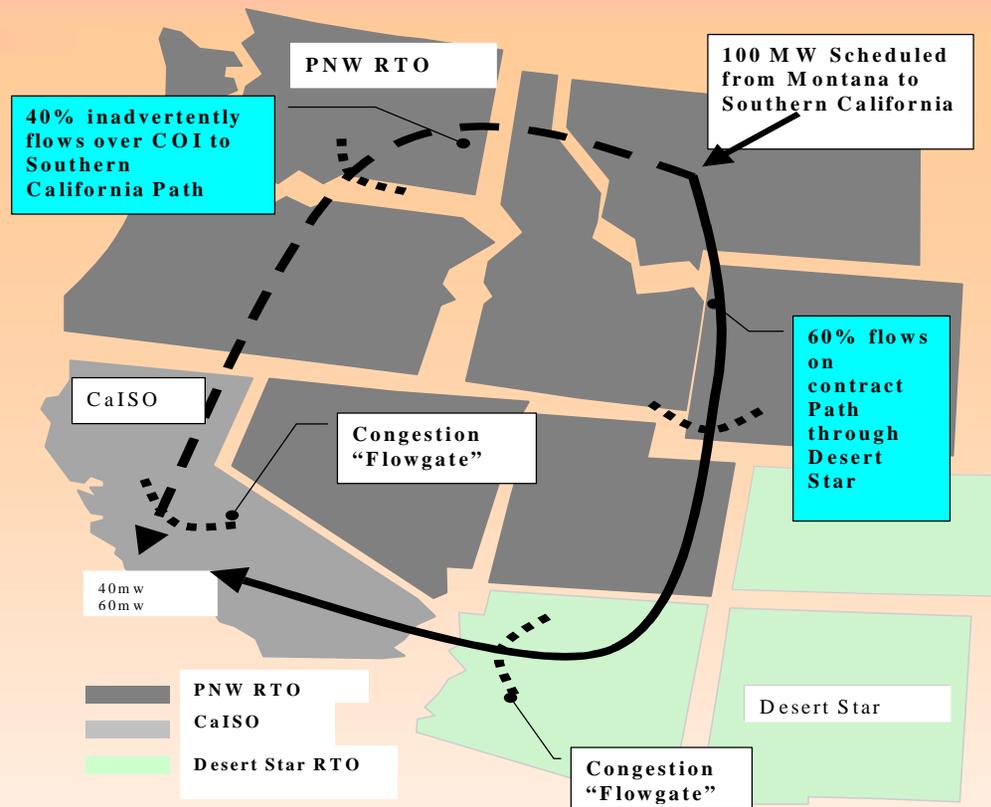
Simultaneous Path Constraints

"TOT"
Flow

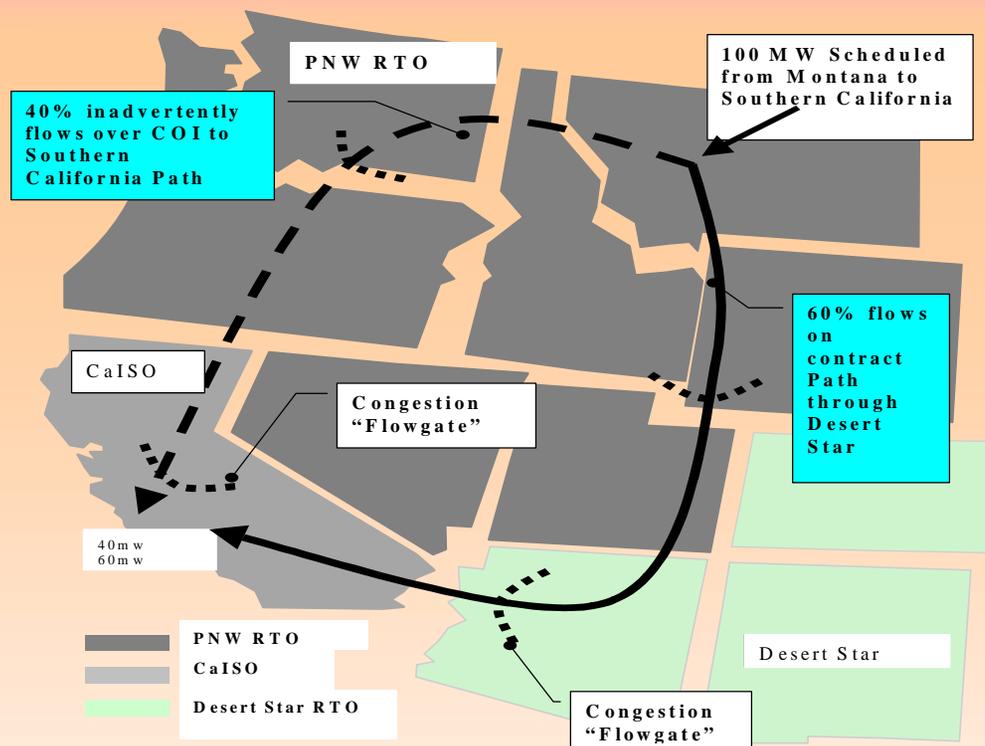


COI Flow

- How will congestion on paths in two RTO's be simultaneously managed using Financial Model ?
- How will congestion be managed using Physical Model ?

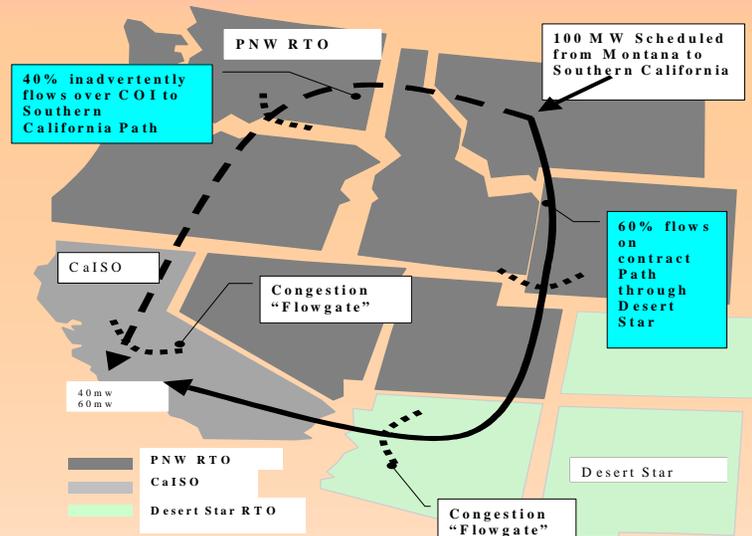


How will existing contract rights be honored if we adopt a flow-based model ?



•Existing “contract path” rights across a seam will be exposed to additional intra and inter-RTO flow-based congestion costs - Who pays these congestion costs ?

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- Existing “contract path” rights generate revenues for the owners of the contract path and produce inadvertent flows that reduce ATC and cause curtailments on other paths.
- Does the owner of the contract path have any obligation to pay for use of the paths the power actually flows over ?