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August 5, 2010

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: ADTRAN, INC. SUBMISSION IN WC DOCKET NO. 10-90, GN DOCKET NO.09-51 AND WC DOCKET NO. 05-337

Dear Ms. Dortch:

ADTRAN, Inc. ("ADTRAN") is submitting via ECFS for the public record in these proceedings the attached redacted version of the description of its proprietary simulation model. Pursuant to Sections 0.457 and 0.459 of the Commission's Rules, ADTRAN separately requested that the Commission withhold from public inspection and accord confidential treatment to those portions of the submission that contain commercially sensitive information that falls within Exemption 4 of the Freedom of Information Act.

Please contact the undersigned if you have any questions with regard to this matter.

Sincerely,

Stephen L. Goodman
Counsel for ADTRAN, Inc.

Capacity to Burst Rate Simulation

August 2010

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Background

- Grew out of comments to FCC / National Broadband Plan process
  - Trying to estimate last mile performance for shared technologies
    - HFC
    - Wireless
    - GPON
- Initially developed simulation to demonstrate sensitivity of performance to parameter changes

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Background – Performance Dependencies

- Performance on a network (or subnetwork) dependent on several factors
  - Total capacity on the network
  - Number of users sharing the network
  - Demand (load) placed on network by users
    - Average demand
    - Distribution of demand
  - Limits (*e.g.*, peak rates)
- Measured performance is determined by *available bandwidth*
  - Bandwidth that isn't being used by others
- For fixed capacity – as average demand rises, available bandwidth (and performance) falls

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Background – Capacity, Demand, Rate Relationship

- Required Capacity
  - Roughly proportional to (demand × users) + target rate
  - More sensitive to changes in demand
    - Multiplied by # users
    - Higher demand → higher required capacity
  - Less sensitive to changes in target rate
    - Higher target rate → higher required capacity
- Performance
  - Sensitive to changes in either capacity or demand
  - Higher capacity → higher rate
  - Higher demand → lower rate

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