

INDOT – JTRP Accelerated Pavement Testing Program

Status Update for JTRP Executive Committee

June 11, 2013

Tommy Nantung and Rebecca McDaniel

Accelerated Pavement Testing (APT) Facility

- Capabilities
- Vision, Mission, Opportunities
- Uses
- Business Plan



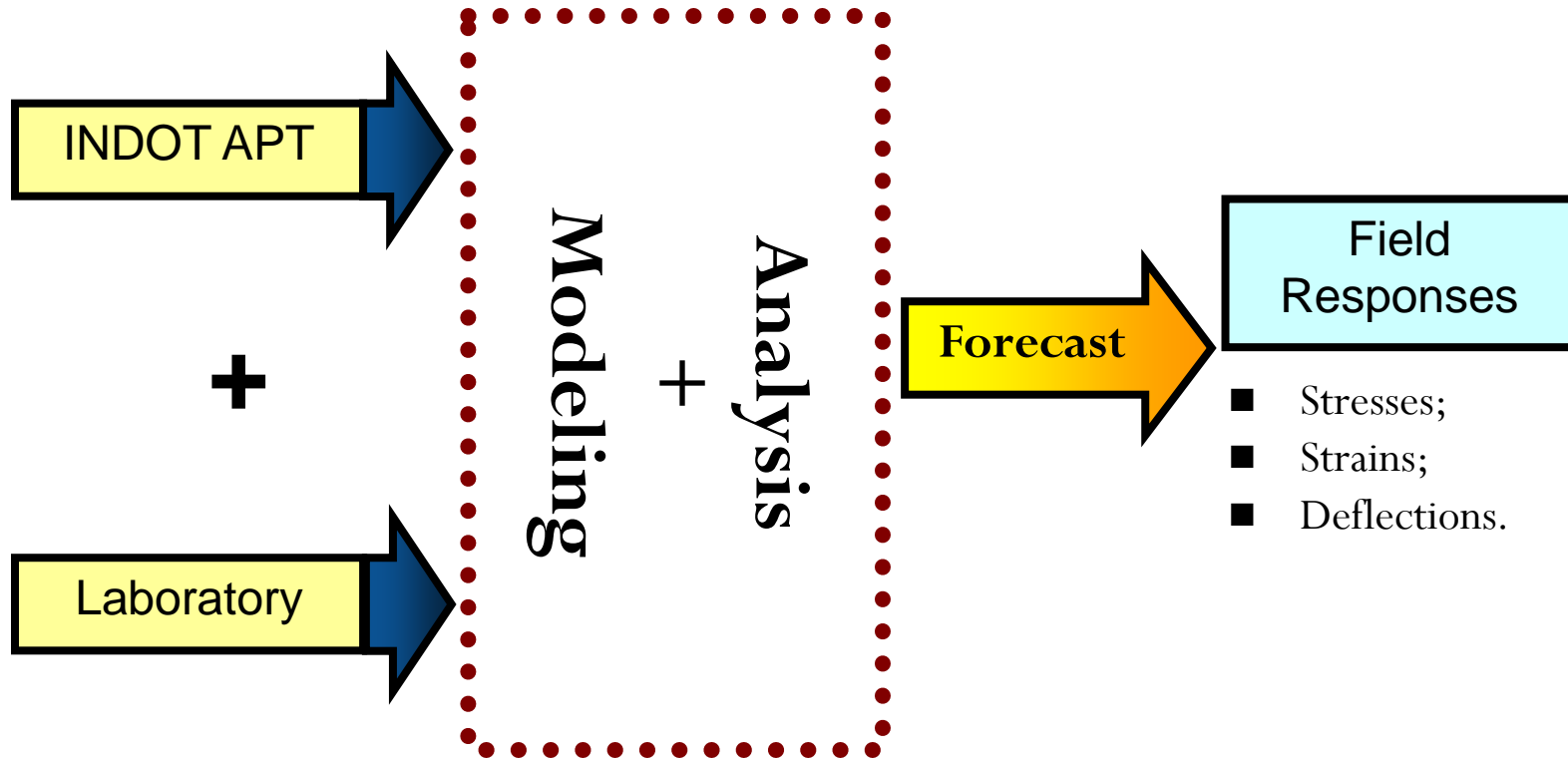
APT

- APT is a simple performance test that can predict several years of truck traffic in just few days of testing.
- Benefit Cost Ratio: Very High
 - A typical contract: \$450,000
 - Construction and testing: \$102,000
- Can be used as a screening tool for high volume roads.

Benefits

- Construct test sections with “normal” equipment and procedures
 - Bridge between lab and field
- Evaluate the performance before building the road.
- Identify those mixes that may have rutting potential.
- Compare relative rutting performance between two or more mixes.
- Testing new pavement materials.
- Determine proper mix thickness relative to maximum nominal aggregate size used.

Research Aim



Vision

To initiate and conduct applied pavement research projects in cooperation with Indiana's pavement industry, INDOT Offices and Districts, Purdue University and external research organizations

Mission

To advance pavement research technology through accelerated testing to solve pavement problems in the field and to determine policies in pavement materials, design and specifications for the Department.

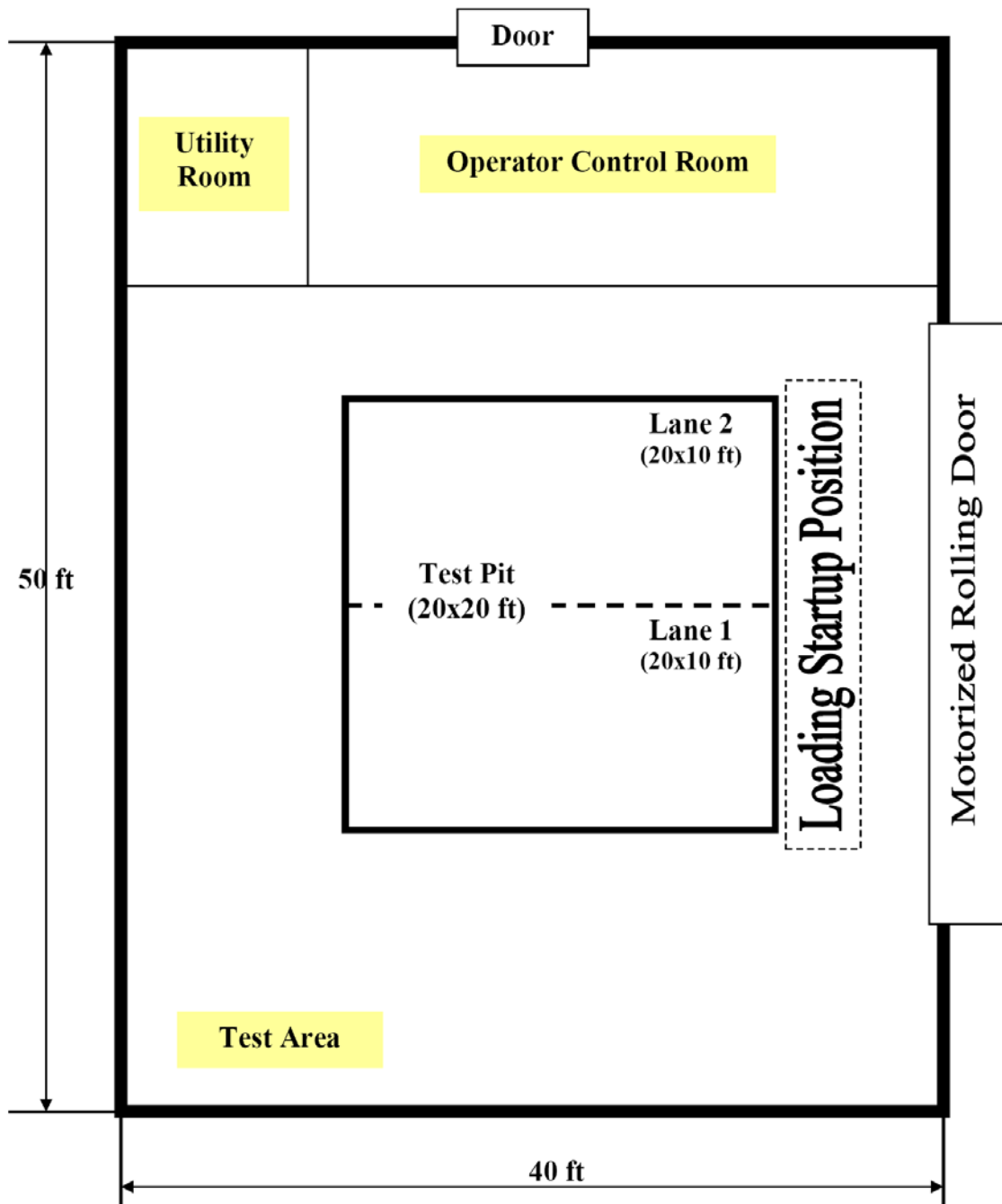
- Developing effective and implementable pavement policies and specifications;
- Reducing pavement construction and maintenance costs and time;
- Meeting and exceeding the design life of pavement; testing pavements faster and more efficiently to accommodate faster decision making in pavement issues

Opportunities

- Facility is fairly unique in that it applies accelerated loading in an enclosed, climate controlled facility.
 - Most other such facilities are outside.
- Opportunities exist to bring in external funding from NCHRP, pooled funds, other states, etc.



- 20 x 20 ft pit
- 6 ft deep
- 1990
- 9,000 – 20,000 Pounds
- 5 mph
- Single axle – dual or super single tires
- 100 psi
- Testing temperature 122 F
- Loading direction and wander



Base Materials and Gauge Installation





Installing Test Mix



Compacting Test Mix



Compacting Test Mix



Compacting Test Mix

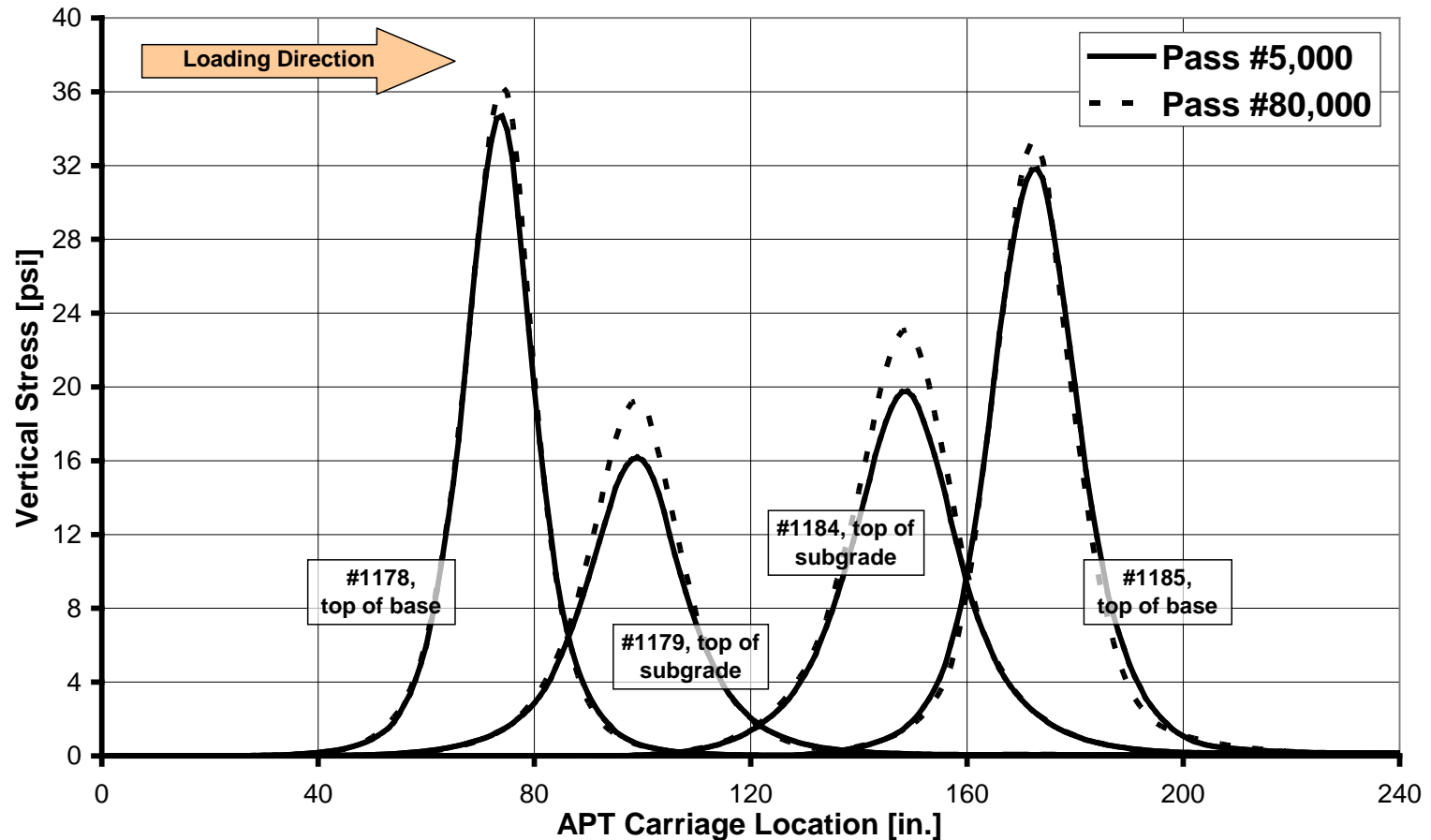


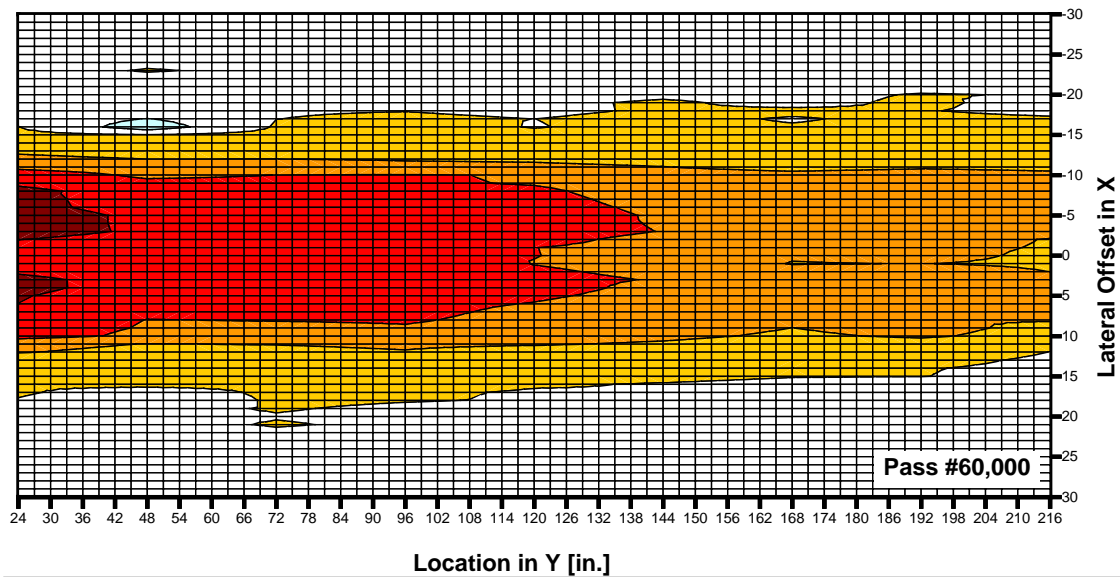
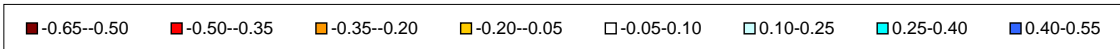
Compacting Test Mix





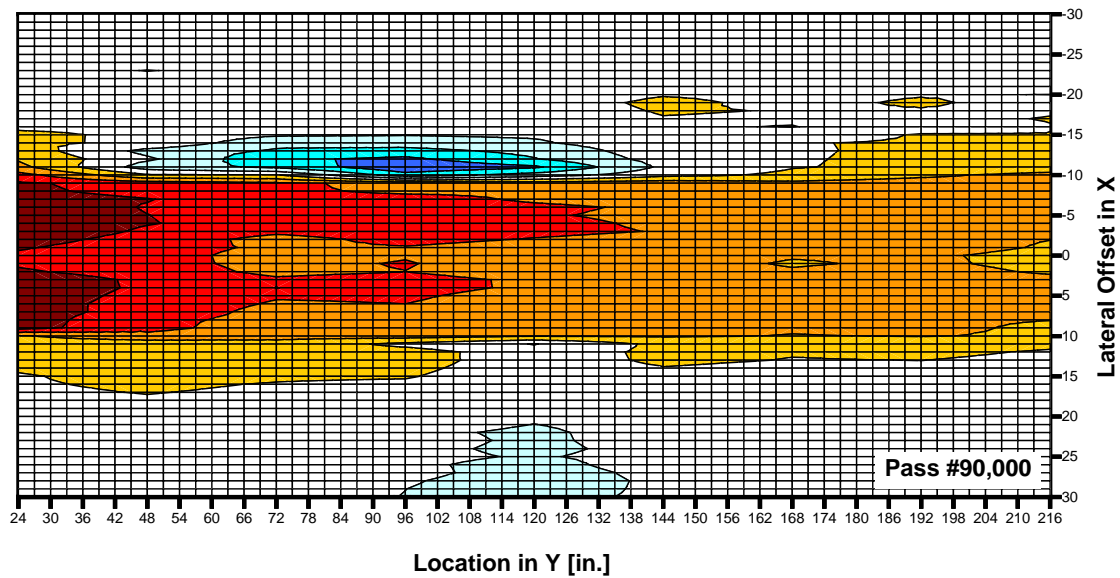
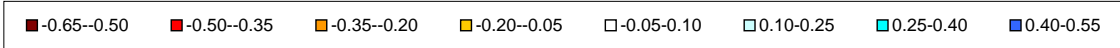
Example Data: Measured vertical stresses in Section n1 on top of the base and on top of the subgrade during pass #5,000 (solid line) and pass #80,000 (dashed line).





Rutting
Development

60,000 passes



90,000 passes

Studies Completed

- National Pooled Fund Study # 176: *Validation of Asphalt Mixtures Specifications Using Accelerated Pavement Testing*. 27 State DOTs, \$650,000
- NCHRP 4-19(2): *Validation of Performance-Related Tests of Aggregates for Use in Hot-Mix Asphalt Pavements*. \$399,975.
- *UTW (Ultra-Thin White Topping) Phase1 (2001)*: \$221,416
- *UTW (Ultra-Thin White Topping) Phase2*: \$300,000
 - November 03 through May 08

Completed APT Studies

- *NCAT Structural Study* (\$1,200,000)
 - May 04 – October 04.
- *Risk Management of Low Air Void Asphalt Concrete Mixtures*
 - \$800,000, including \$600,000 for NCAT Test Track Sections

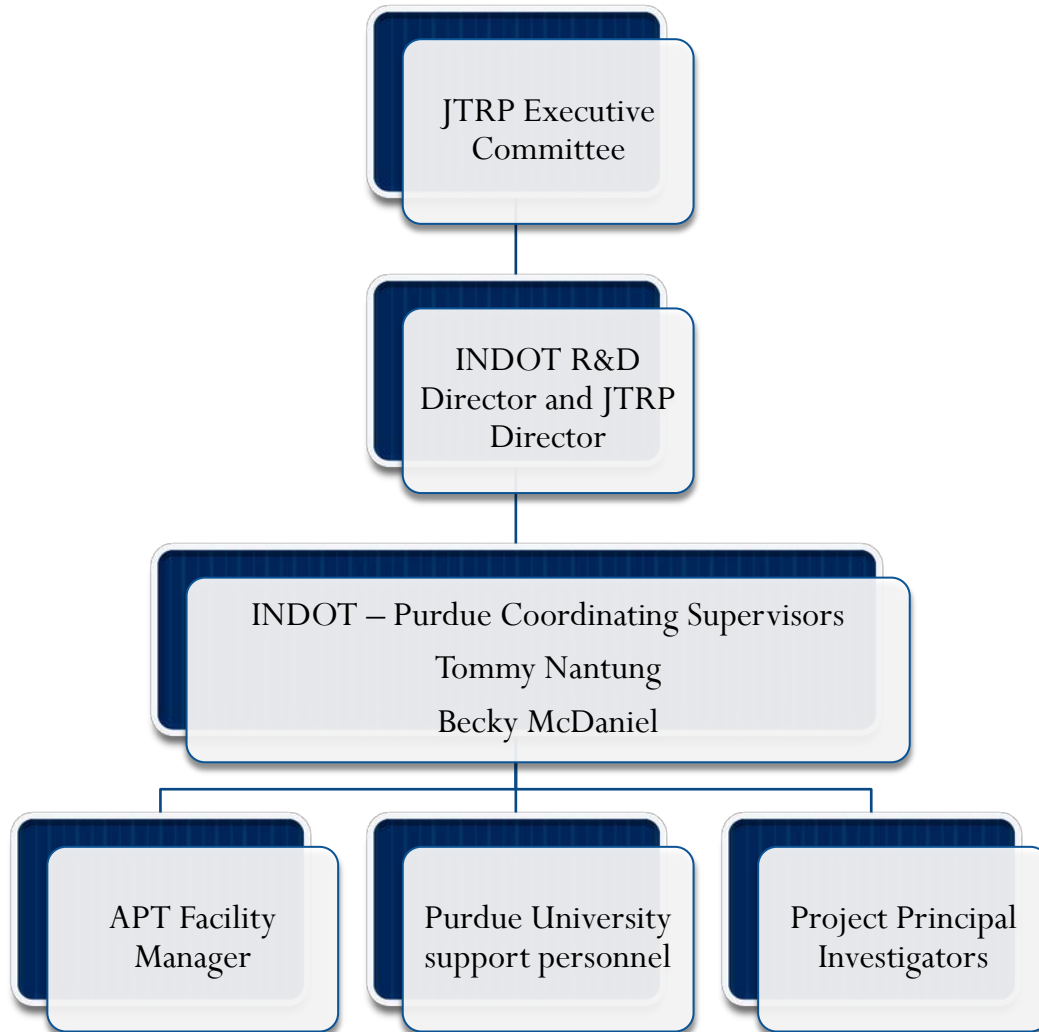
Current and Planned APT Studies

- *Removing Obstacle for Pavement Cost Reduction by Examining Early Age Opening Requirements*
 - Jan 2010 through Dec 2013.
- *SPR-3307 – Efficient Pavement Thickness Design for Indiana: \$100,000*
 - Jan 2009 to Dec 2014
- *SPR-3711 – MEPDG Implementation (Model Calibration): \$150,000*
 - July 2013 to June 2016

Business Case

- Joint effort between INDOT and Purdue JTRP.
- Administered jointly.

Administration



Coordinating Supervisors

INDOT Coordinating Supervisor

- Programming projects
- Strategic Planning
- Chairing Oversight Committee
- Assuring compliance with INDOT policies, etc.
- Ensuring budgets are appropriate
- Securing assistance of other INDOT personnel
- Approving expenditures
- Annual updates to JTRP Executive Committee

Purdue Coordinating Supervisor

- Supervising Purdue employee(s)
 - cost distributions, evaluations, leave requests, etc.
- Ensuring staffing levels in proposals are adequate
- Ensuring expenditures are made in accordance with Purdue procurement requirements
- Collaborating with INDOT CS to promote use of APT
- Serving on APT Oversight Committee
- Collaborating with INDOT CS on annual report

APT Facility Manager

- Purdue employee funded through research projects and APT Maintenance Account
- Advises researchers on capabilities, operations and time requirements
- Coordinates with researchers and graduate students to complete research projects, collects and transfers data
- Coordinates construction and removal of test sections, instrumentation, maintenance of facility, modifications, etc.
- Programs and operates APT equipment, initiates procurement of supplies and equipment
- Enforces safety procedures

APT Operational Costs

- APT Facility Manager and Purdue Coordinating Supervisor salaries are charged to applicable research budgets during conduct of project and to administrative line item during maintenance periods between projects.
- Research projects must also budget for construction/removal of test sections, costs of any modifications, instrumentation, supplies, etc.
- Specific budgets are developed for each project.
- Guideline for planning purposes – minimum six month period for operations, \$42,000.

Management of Funding and Budget

- All expenditures are handled through Purdue JTRP accounts.
 - JTRP and INDOT projects set up subaccounts
 - Outside research agencies – contract with Purdue
- INDOT R&D Manager ultimately approves all expenditures after initial review/approval by Coordinating Supervisors
- JTRP Office will prepare quarterly financial reports for INDOT R&D Manager and JTRP Executive Committee.

Other Reporting Requirements

- APT Facility Manager reports to Coordinating Supervisors, quarterly meetings
 - Purdue for personnel and procurement
 - INDOT for overall management
- INDOT CS reports to INDOT R&D Manager
- Purdue CS reports to JTRP Director
- INDOT and Purdue CS jointly report to JTRP Executive Committee and Oversight Committee

Questions and comments
