

Waterway Analysis Model Batch Processing Program - WAM BPP

Lock Capacity Analysis

Sharon Weekley

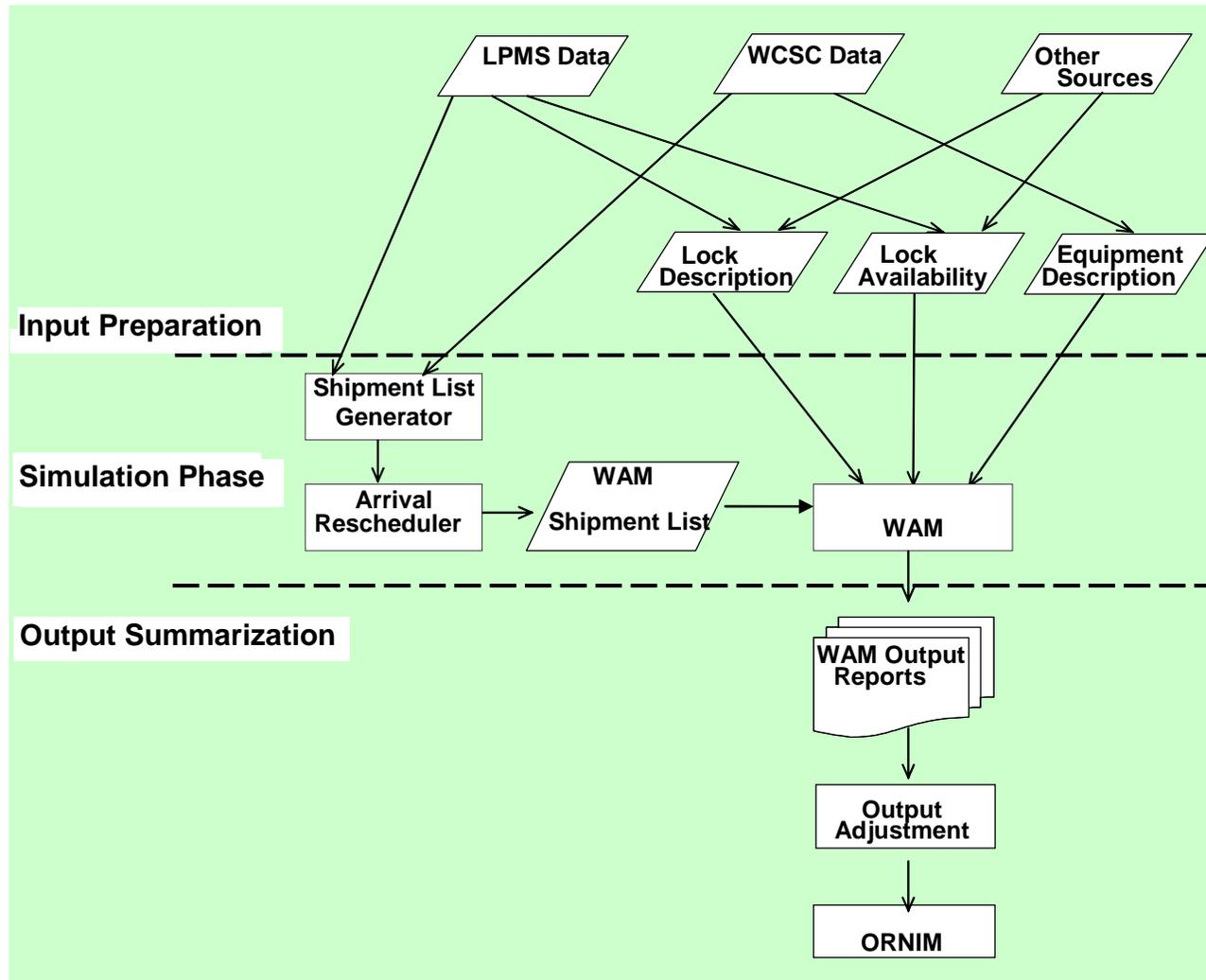
**USACE Navigation Planning Center of
Expertise**

Huntington District

Waterway Analysis Model – WAM

- **WAM is a Simulation Model developed by the Corps to determine the impact of tow movements on the inland waterway system**
 - *simulates tow (towboat plus barges) movements through navigation locks based on the model configuration.*
- **4 Major Components of WAM**
 - **System Description Input Data** – waterway network, tow fleet, cargo
 - **External Event Input Data** – tow arrivals, lock downtimes
 - **Simulation Program** - processes tows through the waterway network from origin to destination (O-D pairs) ports.
 - **WAM Model Output** - detailed lock database tables

Waterway Analysis Model Process Overview



Waterway Analysis Model (WAM)

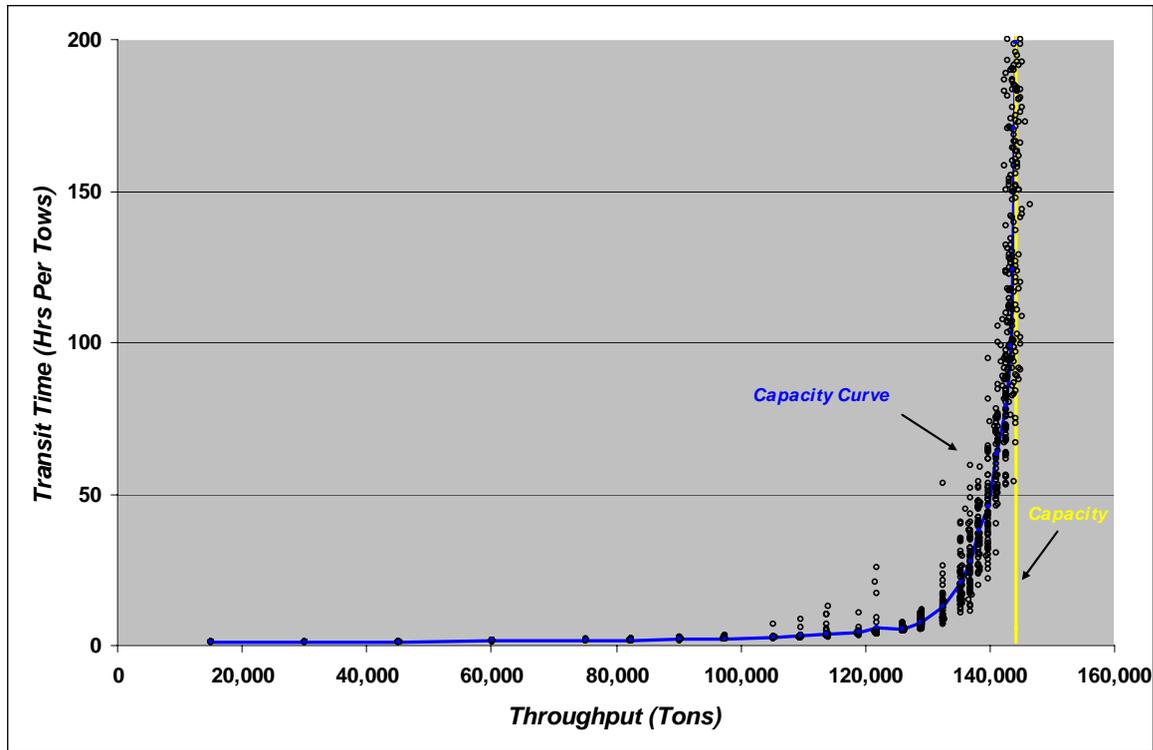
Lock Capacity Analysis

- Purpose of WAM is to create Lock Capacity Curves.
- Capacity Analysis - relationship between traffic demand (tonnage) and expected tow transit times (delay + processing times).
- Transit time includes the time the vessel is “delayed” and the time needed to “process” the vessel through the lock.
- Tow arrives at a lock & either “waits” (facility is busy) or is “processed” (moves tonnage) through a lock chamber.
- During chamber downtimes, vessels must either use another chamber or wait until the downtime ends - causing increased processing times and high delays at the lock projects.

Lock Capacity Curve

One Set of WAM Runs

(average of 50 runs at 27 different traffic levels)



Family of Curves –

Lock Chamber Downtimes & Closure Events

- **Family of Curves - *collection of 26 curves created using lock chamber downtimes & unique long closure events***
- **Two Types of Closure Events**
 1. **Random Minor Stalls (unscheduled events < 1 day)**
 - **Full OP Curve – *Main & Auxiliary Chambers Open***
 2. **Long Closures (scheduled or unscheduled events > 1 day)**
 - ***Main or Auxiliary Chambers Closed due to Major Maintenance or Rehabilitation Events***
 - **Family of Curves (1, 3, 5, 10, 15, 30, 45, 60, 90, 180, & 365 Day Closures)**
 - **Queue Limits & Half Speeds (30, 45, 60, & 90 Day Closures)**

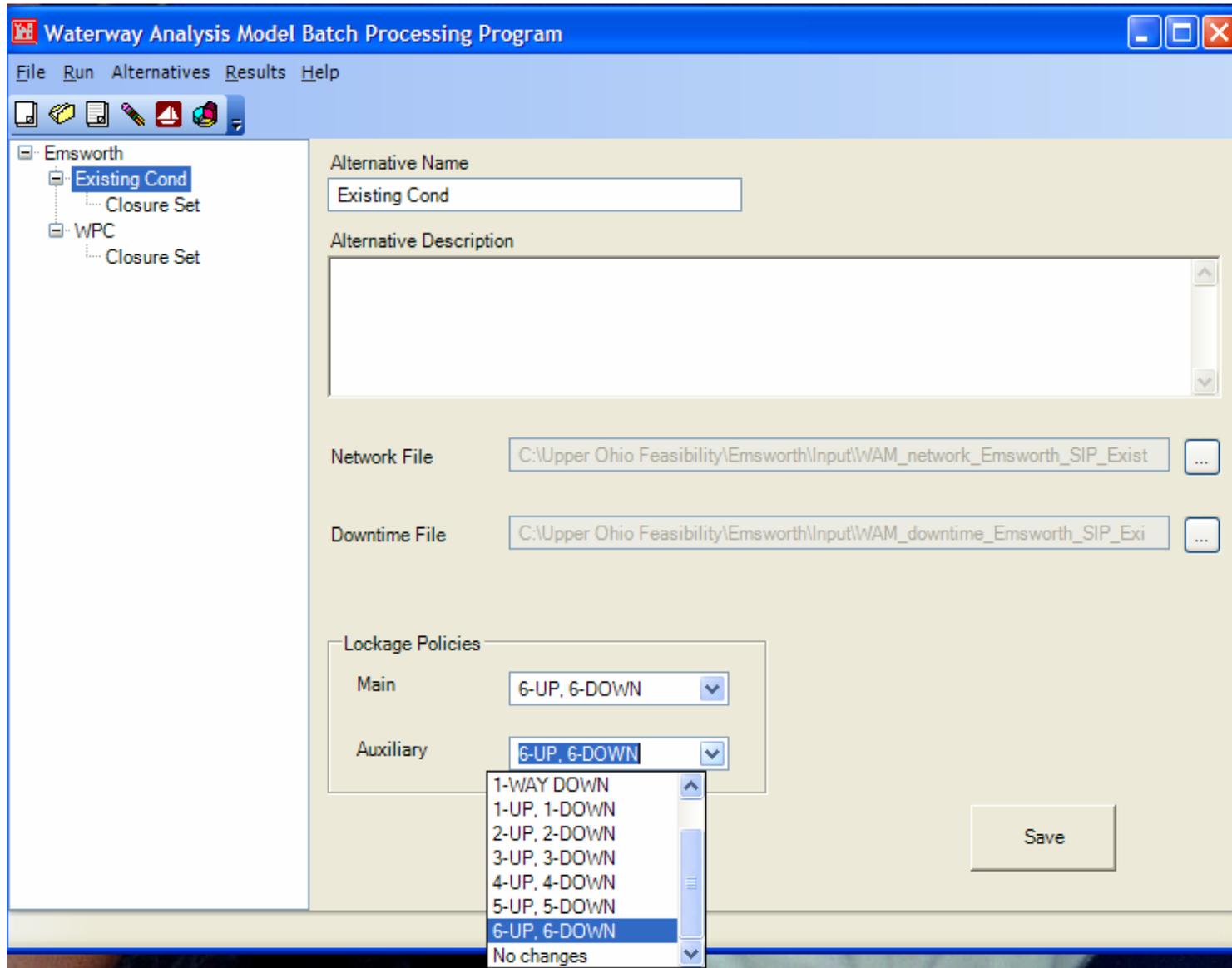
Waterway Analysis Model Batch Processing Program - WAM BPP

WAM BPP was developed to:

- **Eliminate the process of creating separate Downtime & Startup files**
- **Modify Input Files before a WAM Run**
- **Specify and save all the Parameters to define a WAM Run**
- **Execute several programs to make the WAM Run**
- **Read and Write to and from ASCII text files**
- **Store the Output Results in Access Database Tables**

WAM BPP

Project Alternatives



WAM BPP

Lock Closure Scenarios

Waterway Analysis Model Batch Processing Program

File Run Alternatives Results Help

Emsworth

- Existing Cond
 - Closure Set
- WPC
 - Closure Set

Closure Sets					
Chamber	StartTime	Downtime	Type	UseQueueLimits	
▶ 1	90	1	Unscheduled	<input type="checkbox"/>	
1	90	3	Unscheduled	<input type="checkbox"/>	
1	90	5	Unscheduled	<input type="checkbox"/>	
1	90	10	Unscheduled	<input type="checkbox"/>	
1	90	15	Unscheduled	<input type="checkbox"/>	
1	90	30	Scheduled	<input checked="" type="checkbox"/>	
1	90	45	Scheduled	<input checked="" type="checkbox"/>	
1	90	60	Scheduled	<input checked="" type="checkbox"/>	
1	90	90	Scheduled	<input checked="" type="checkbox"/>	
1	90	180	Unscheduled	<input type="checkbox"/>	
1	0	365	Unscheduled	<input type="checkbox"/>	
1	90	30	Slowdown	<input type="checkbox"/>	
1	90	45	Slowdown	<input type="checkbox"/>	
1	90	90	Slowdown	<input type="checkbox"/>	
2	90	15	Unscheduled	<input type="checkbox"/>	
2	90	30	Scheduled	<input checked="" type="checkbox"/>	

Add Row Set Queue Limit Options

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File Run Alternatives Results Help

Emsworth

- Existing Cond
 - Closure Set
- WPC
 - Closure Set

Name: Emsworth

Description:

WAM Settings

Number of Runs: 50

Number of Points: 27

Maximum Tow Delay: 200

Delay Confidence: 0

Shipment Generator Settings

Traffic Escalator: 100

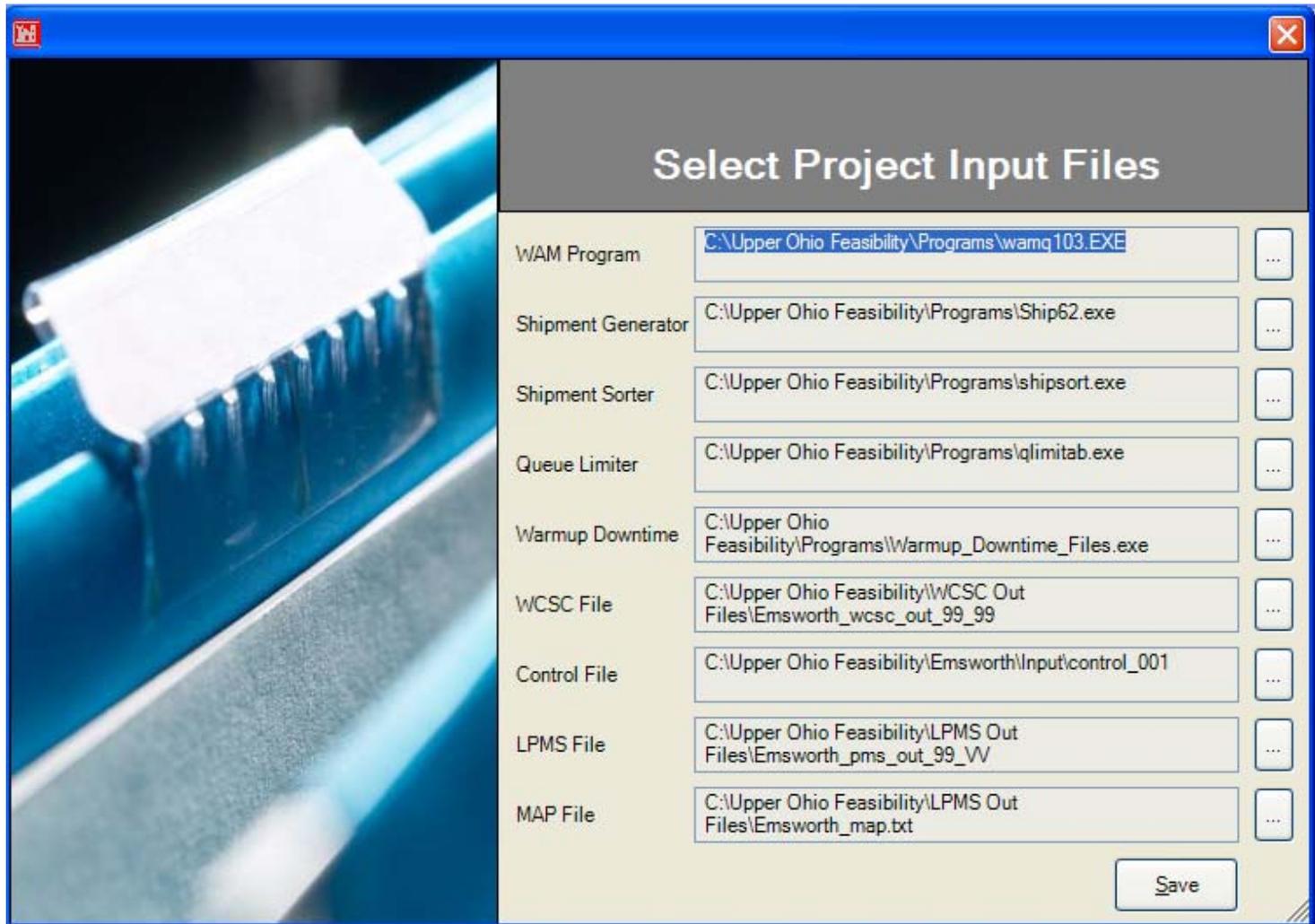
Warmup (in days): 30

Output Directory: C:\Upper Ohio Feasibility\Emsworth\Output

Random Number Seed: 1000 [Reset]

[Archive Options] [Select Input Files]

WAM BPP - Executable Programs



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Questions ???