

System Design Analysis for Pneumatic Tube Systems

Learn how Swisslog Healthcare's System Design Analysis (SDA) team can improve transport automation at your facility.

Partnering with us, you can expect to optimize the pneumatic tube system (PTS), improve user satisfaction with the system, and facilitate timelier patient care.

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Patient Experience

It's important to find technology partners that help clinicians and staff in your facility improve patient care quality and create better inpatient experiences.

Depending on facility size, hospital employees may send as many as 10,000 carriers a day, delivering medications, blood products, and specimens to expectant users at the receiving station.

Selecting the right pneumatic tube system solution can enhance your patients' experience by hastening the onset of treatment plans, informed by lab testing and pharmacy medication management.

Staff Utilization

In facilities without PTS or where the PTS doesn't meet user needs, staff may supplement by moving materials manually by courier. While it may seem like a good idea for people to pitch in to transport specimens or medications, far more valuable skilled labor time is actually lost than might be realized, considering walking pace, interruptions or delays, distractions en route, and return trip time.

Instead, by investing in a SDA consultation, a facility will receive empirical evidence to guide decision-making about PTS configuration and workflow. Our recommendations can directly impact patient care and improve staff job satisfaction by eliminating a low-value, routine task.



«If you add to a PTS system, it's going to get bigger. It's going to move more carriers. Departments are going to be further from one another, and that can have a dramatic impact on how the system behaves.»

«Our team analyzes different approaches to building a PTS design that meets the needs of the facility, gives them growth for the future as they add services or increase the use of the system.»

– Paul Ristuccia, Senior System Design Analyst, 28 years with Swisslog Healthcare.

New System Consulting

Facilities planning an expansion or additional buildings or renovations should consider the downstream effects of placing increased demands on the PTS – rather through increased carrier throughput or increasing distance between high-volume departments like lab, pharmacy, ED, and blood bank.

Higher-than-normal carrier volumes and longer routes between key departments place new demands on a pneumatic tube system. Without SDA consulting

and test simulations, the outcomes may be less than desirable to users and result in problematic workflows.

Maximize infrastructure investments by leveraging the expertise of our SDA team. Hundreds of discussions with actual users and hours spent on focused field research enable our design engineers to form recommendations specific to your facility's unique circumstances.



Optimizing Existing Systems

Over time, it's a good idea to give your PTS the equivalent of a general physical. While nothing may be 'wrong' with the PTS performance, simulation and analysis by our SDA team may lead to recommendations that create significant time savings for staff and **keep your PTS running at a performance level that promotes continued use and better patient outcomes.**

Virtual Simulation

Our design engineers deploy exclusive real-time simulation software borne from analyzing more than 1 billion carrier sends each year for over 2,400 customers. The simulations test the functionality and actual performance of a PTS configuration against baseline and design-specific system performance objectives.

Traffic Study

The SDA team examines current and projected PTS traffic between all facility departments. Understanding the dynamics of your day-to-day operation is key to correcting an inefficient system or implementing a more optimal new system design.

Wait Time Study

Wait time is the delay between when a user initiates a carrier send and the time the system begins to process that carrier. Excessive wait time is a major

complaint of pneumatic tube system users.

Transaction Time Study

Transaction time is the sum of wait time and travel time. Having brief wait times may not be enough; carrier routing must also be fast and efficient. A transaction time study uncovers any bottlenecks within the system to help the SDA group achieve optimal system design.

System Uptime Study

Measuring the availability of your pneumatic tube system to users, an uptime study compares actual system performance against benchmarks. This study is useful when evaluating preventative maintenance steps and alarm occurrences by pinpointing improvement opportunities with specific equipment, surfacing new routes to connect functional department areas, and certain other scenarios.



Sample Study

Below is a sample chart from an actual study conducted with one of our hospital customers during an engagement with our SDA team.

Medium Hospital

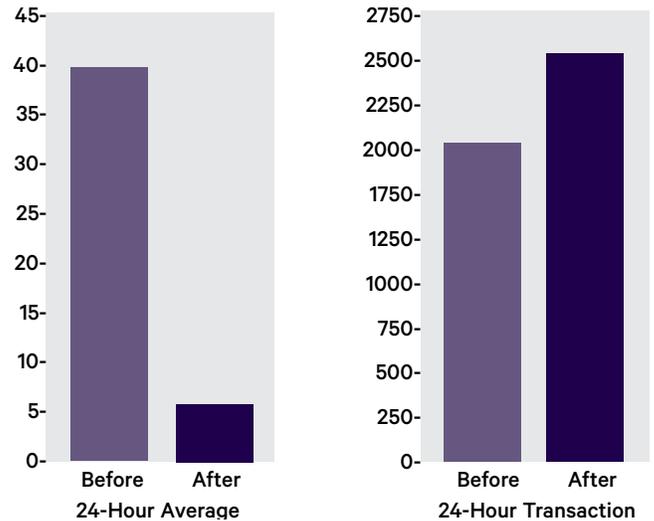
264-bed facility in Wisconsin: 4-inch system with 19 stations

Before SDA

The average peak hour dispatch wait time was 100+ seconds with system transactions at an average of 1,978 per day. Transactions departing within 2 minutes was 80%.

After SDA

- Daily 24-hour average wait time decreased from 40 seconds to 6.4 seconds
- Daily traffic increased to over 2,499 per day
- Transactions departing within 2 minutes



«Look at it from the perspective of, how long is it going to take to get that medication to its ultimate destination or the lab specimen into the lab so they can begin a treatment program? **Thinking about what rides on the performance of the PTS,** that kind of changes the way you look at design.»

– Paul Ristuccia



Consider This

A medium-size VA hospital (200-400 beds) typically has five PTS transactions an hour across 30 stations. **For a 300-bed facility, the PTS automates what would otherwise be over 300 hours per day of manual (courier) transport.** At a nurse rate of \$30/hr, the 300 hours/day spent couriering has an operational cost of \$9,000 per day in low-value labor expenses (unloaded cost). Additionally, the downstream effects of "batching" deliveries to save trips can lead to longer turn-around times from the lab with a direct impact on the quality of patient care.

Facts

- Swisslog Healthcare developed the **only real-time PTS simulation tool** capable of modeling a facility's actual traffic, projected future traffic, and traffic representative of hospitals of similar size and parameters. This is made possible by our extensive industry experience and customer base.
- The System Design Analysis team can **consult with general contractors and architects to evaluate building plans to determine whether specifications will meet user objectives.** Our team can also identify potential scenario-based gains or improvements in cases of expansion/addition or when user demand outpaces performance.
- **Xpress is specifically designed to resolve issues experienced by facilities logging high volumes of carrier traffic** and where key departments are 1,500 feet or more apart.

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