Turnstile Throughput Considerations

When estimating the number of turnstiles required for an application, a major factor to consider is rate of throughput...which is commonly defined as the number of people passing through a turnstile per minute.

Throughput Affecting Factors

Controlled Access vs. Free Access

Controlled access requires a user to present a credential. When access is controlled, the access system provides a signal to the turnstile to either open or unlock. Free access (often used in exiting) allows the user to pass without presenting a credential. With free access, the turnstile is either constantly unlocked or opens automatically without a signal from the access system. Free access will have a higher rate of throughput than controlled access.

Access System Response Time

Access systems check the presented credential and then provide a signal to the turnstile to open or unlock if the credential is valid. The time it takes an access system to check credentials and provide a signal to the turnstile will vary between systems. Even access systems with fast response times may periodically have a slower response. The slower the access system response time, the slower the rate of throughput.

Card Reader/Access Device Type

Rate of throughput will also vary depending on the access device used. A longer-range proximity reader, which allows a user to keep their access card in their wallet or purse during the access process, will provide a faster rate of throughput than a card that has to be removed to be read. Use of a proximity reader that also requires the user to enter an access code will decrease the rate of throughput. A biometric device (depending on the device and application) can decrease the rate of throughput substantially.

Human Factors

Human factors (such as the age of the user population) can also substantially affect throughput. As with any new technology, there is a "learning curve" for users when initially using new equipment. User training is important for system acceptance and smooth operation.

Turnstile Type

Waist high turnstiles (such as the EDC) will generally have a higher throughput rate than full height turnstiles (MST or CPST) due to the shorter distance a user will travel when going through the device. Barrier optical turnstiles (SU3000, SU3500 or SU4000) will generally have a rate of throughput approximately equivalent to waist high turnstiles.

Throughput Recommendations:

Assuming use of a proximity card and a 250 millisecond access response time (1/4 second), a real life good rule of thumb is a throughput rate of about 3 – 4 seconds for an optical turnstile or waist high turnstile and 4 seconds for a full height turnstile.

To determine the number of turnstiles sufficient for a facility, the following formula can be used:

(Number of Patrons / time allotted) / rate of throughput = number of turnstiles required

Example:

Assuming a 4 second throughput rate (15 people per minute per turnstile), it would take approximately nine devices to allow 4000 patrons to enter in a 30 minute time span.

(4000 ÷ 30) ÷ 15 = 8.88

Please contact Alvarado with questions or for information
Alvarado Manufacturing Co.

12660 Colony St. Chino, CA 91710
Toll Free: **800.423.4143**   Int: **909.591.8431**   Fax: **909.628.1403**
info@alvaradomfg.com   www.alvaradomfg.com

ALVARADO

Protecting assets and controlling the flow of people