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TURNSTILE THROUGHPUT CONSIDERATIONS

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

Optical Turnstile:
45-60 People Per Minute

Full-Height Turnstile:
20-25 People Per Minute

Waist-Height Turnstile:
20-40 People Per Minute

Human Factors

Human factors can substantially affect throughput.
As with any new technology, there is a "learning curve" for users when initially using new equipment.
If users, are not prepared to present their credential when arriving at the turnstile, this can slow down the entry process.
User training is important for system acceptance and smooth operation, which will increase throughput.

Controlled Access VS. Free Access

'**Controlled Access**' requires a user to present a credential, such as Proximity Card or mobile device.
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 a pin code will decrease the rate of throughput.
A biometric device (depending on the device and application) can increase or decrease the rate of throughput depending on if it is contactless or not.

Turnstile Type

Waist-high turnstiles (such as the Alvarado EDC) will generally have a higher throughput rate than full-height turnstiles (Alvarado MST or CPST) due to the shorter distance a user will travel when going through the device.
Barrier optical turnstiles (Alvarado SU5000) will generally have the greatest rate of throughput since the equipment stacks credentials (meaning multiple users can present his/her card one after the other without the panels cycling)

Throughput Recommendations

Assuming use of a proximity card and a 250 millisecond access response time (1/4 second), under ideal conditions, a good rule of thumb is a throughput rate of 1-2 seconds for optical and waist high turnstiles and 3-4 seconds for full height turnstiles.

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

(4000 ÷ 30) ÷ 30 = 4.44

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for an initial consultation.
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