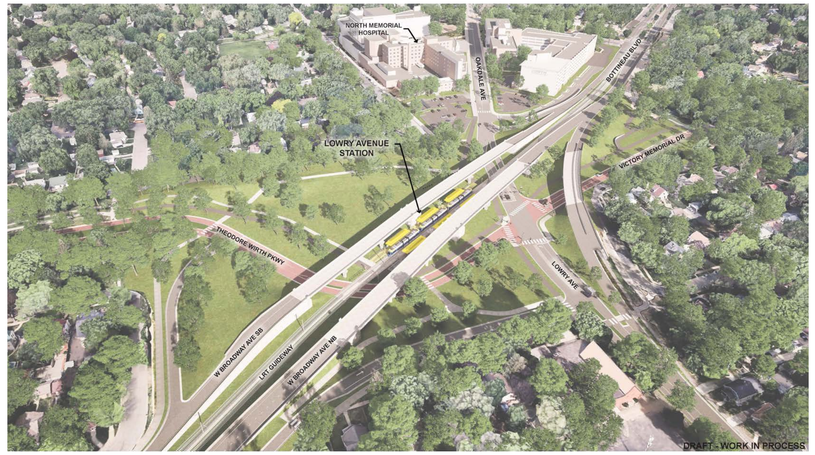
LOWRY AVENUE STATION VISUALIZATIONS

MUNICIPAL CONSENT DESIGN, AT-GRADE STATION AND CROSSING (OPTION A)

This is the current design for the Lowry Avenue Station area. Station and LRT tracks are at grade, with at-grade crossings of the Wirth/Victory Memorial Parkway, Grand Rounds Trail, and Lowry/Oakdale Avenue.

- At-grade station is more visible and accessible to the community
- Creates additional parkland
- Builds on existing infrastructure (bridges)
- Cost efficient
- Parkway and trail users along Theodore Wirth Parkway may encounter a gate crossing, but experience is largely unchanged
  - » Gate operations are 45 seconds, 25 second average delays if encountered
  - » Gates are up about 90% of the time
- May modify EMS response route and timing



COMMENTS

LOWRY AVENUE STATION VISUALIZATIONS
ALTERNATE DESIGN, AT-GRADE STATION WITH NO CROSSINGS (OPTION H)

This is the alternative design for the Lowry Avenue Station area. Station and LRT tracks are at-grade, with the Wirth/Victory Memorial Parkway and Grand Rounds Trail below grade. Lowry/Oakdale Avenue will meet with West Broadway Avenue (CR 81) and the LRT tracks at a signalized intersection.

- At-grade station and signalized intersection are good for safety, security, and accessibility
- No rail crossing gates necessary
  - » Parkway and trail bypass Lowry Ave, West Broadway Ave (CR 81), and LRT Tracks
- Parkway and trail users in "trench", underneath the station and tracks
- Right turn from northbound West Broadway Ave to eastbound Lowry Ave would continue to use N Washburn Ave
- More costly than current design

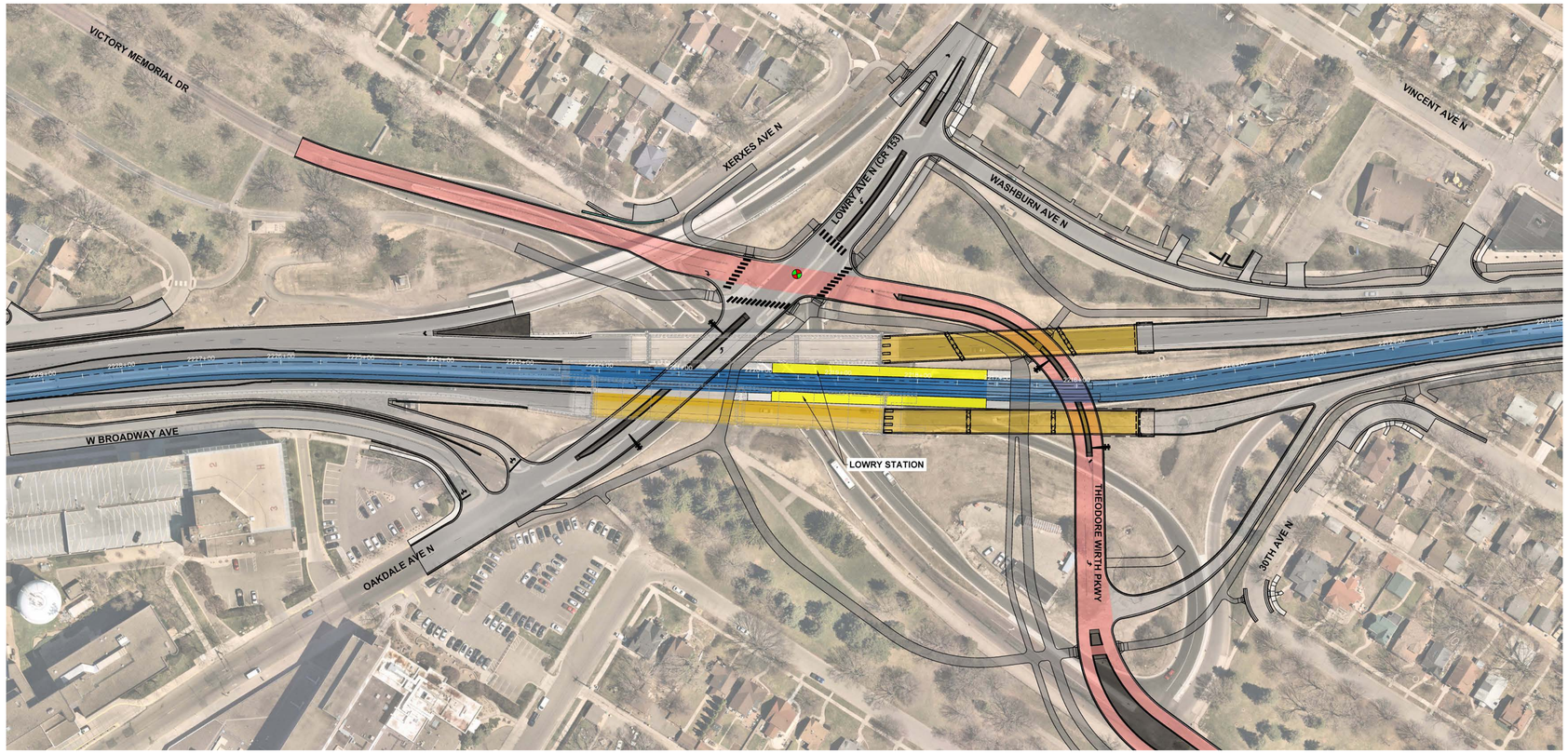
COMMENTS

LOWRY AVENUE STATION DESIGN OPTIONS

OPTION A: MUNICIPAL CONSENT DESIGN

	Option A – Municipal Consent Design
Station accessibility, safety, experience	At-grade station maximizes accessibility, integrated station within park provides positive user experience, visible platform improves safety
Park and trail impacts	Requires re-routing of parkway and trail, at-grade gated crossings of trail and parkway next to station. Creates additional park space.
Hospital traffic, access	Gated crossing at Oakdale/Lowry may create average of 25 seconds delay on 10% of trips, could be mitigated by alternate wayfinding/ routing for hospital
Area traffic operations, connectivity	Maintains existing road network
Neighborhood connectivity	Station provides convenient access for neighborhoods
Impacts to new bridges	Keeps existing three bridges but modifies southbound County Road 81 bridge to reduce overall width.
Constructability, construction impacts	Less complex foundation construction
Cost	Comparatively lower cost

- At-grade station and crossings
- Preserves and modifies new bridges over Lowry

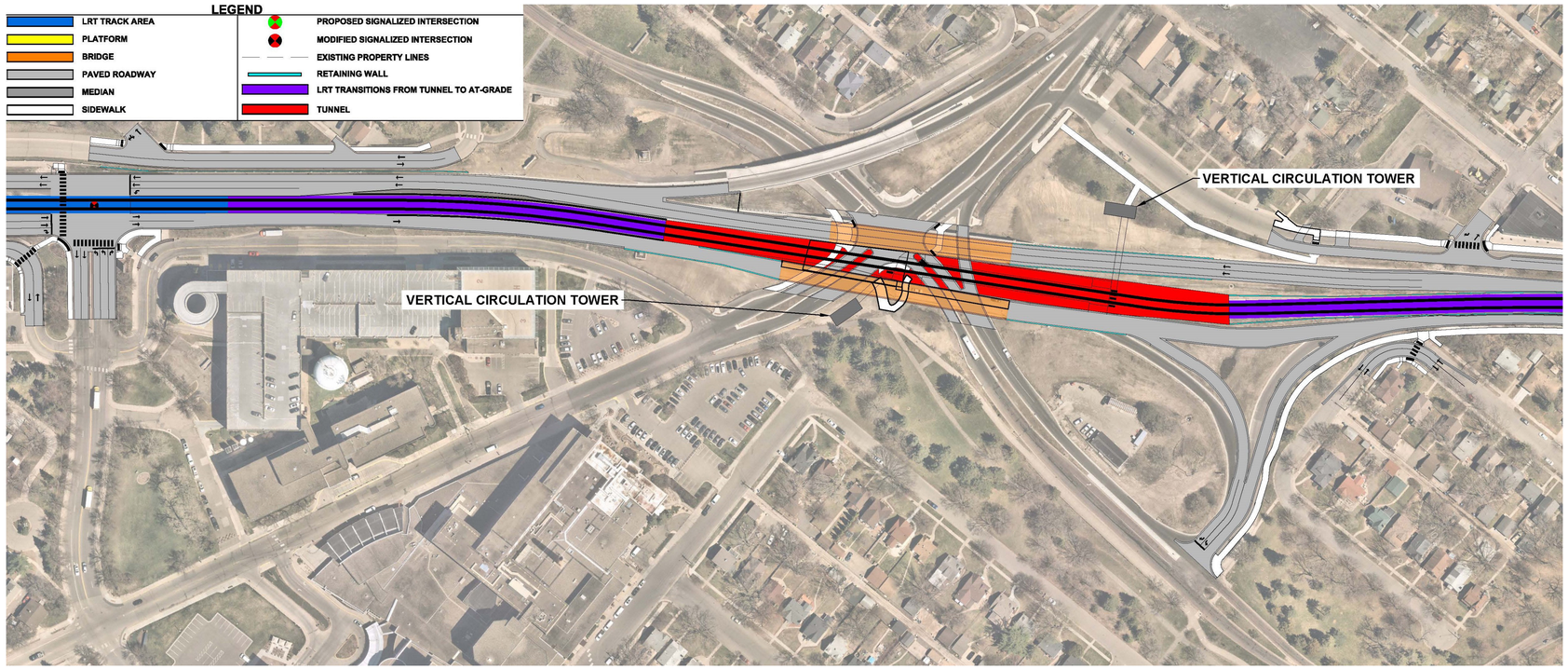


LOWRY AVENUE STATION DESIGN OPTIONS

OPTION B: LRT IN A TUNNEL

	Option B
Station accessibility, safety, experience	Underground station not visible from surrounding area, poor transit rider experience, no eyes on platform creates safety concerns
Park and trail impacts	Parkway and trails do not cross with LRT
Hospital traffic, access	No gated crossings, no interruption to hospital access
Area traffic operations, connectivity	Roadway connections same as existing
Neighborhood connectivity	Underground station disconnected visually from surrounding neighborhood
Impacts to new bridges	Southbound and northbound County Road 81 bridges are removed and replaced
Constructability, construction impacts	Constructability challenges with existing piling and complexity of design, multiple additional years construction duration and disturbance
Cost	Very high cost

- Station underground below West Broadway Ave (County Road 81) bridges
- Grade separated from parkway
- Roadway network stays unchanged from existing conditions



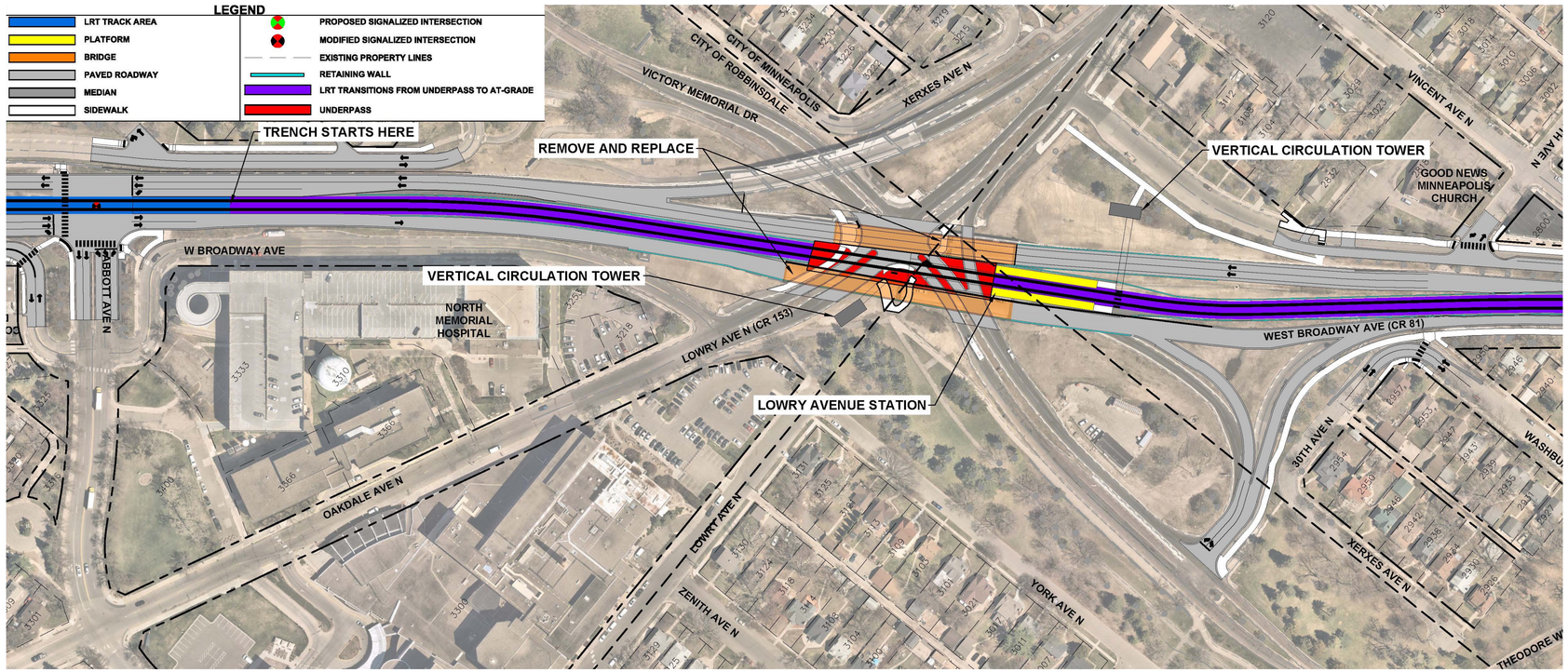
Better than option A | About same as option A | Worse than option A

LOWRY AVENUE STATION DESIGN OPTIONS

OPTION C: LRT IN A TRENCH

	Option C
Station accessibility, safety, experience	Station in trench and less visible from surrounding area, poor transit rider experience, less eyes on platform creates safety concerns
Park and trail impacts	Parkway and trails do not cross LRT
Hospital traffic, access	No gated crossings, no interruption to hospital access
Area traffic operations, connectivity	Roadway connections same as existing
Neighborhood connectivity	Station in trench and disconnected visually from surrounding neighborhood
Impacts to new bridges	Southbound and northbound County Road 81 bridges are removed and replaced
Constructability, construction impacts	Constructability challenges with existing piling and complexity of design, multiple additional years construction duration and disturbance
Cost	Very high cost

- Station underground below West Broadway Ave (County Road 81) bridges
- Grade separated from parkway
- Roadway network stays unchanged from existing conditions



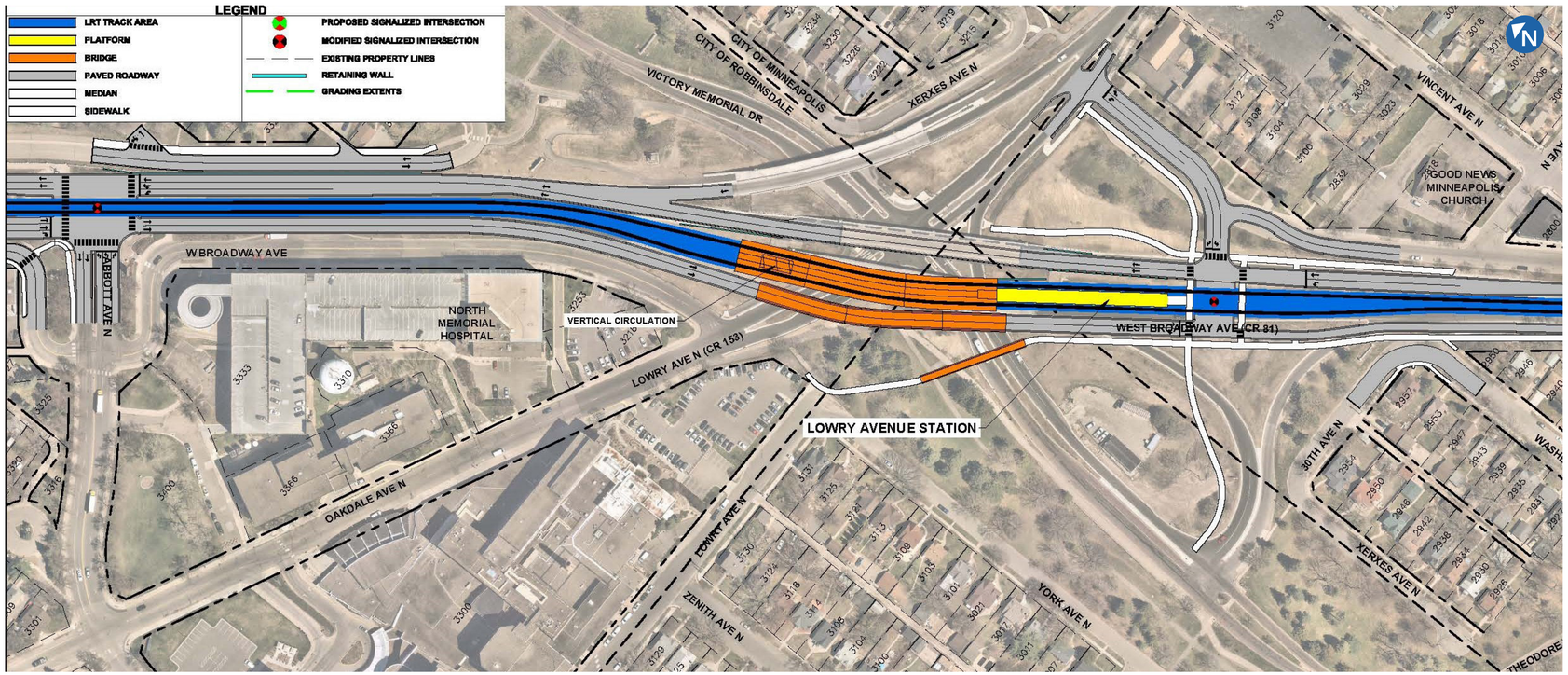
Better than option A | About same as option A | Worse than option A

LOWRY AVENUE STATION DESIGN OPTIONS

OPTION D1: LRT CENTER RUNNING AT THE SAME ELEVATION AS WEST BROADWAY AVE BRIDGES

	Option D1
Station accessibility, safety, experience	Elevated station requires several new bridges to get transit riders to platform
Park and trail impacts	Parkway and trails do not cross LRT
Hospital traffic, access	No gated crossings, no interruption to hospital access
Area traffic operations, connectivity	Adds a traffic signal south of the station at Washburn
Neighborhood connectivity	Elevated station disconnected from neighborhood
Impacts to new bridges	Southbound County Road 81 bridge is removed and replaced
Constructability, construction impacts	Constructability challenges with existing pilling, moderately complex design
Cost	Comparatively lower cost

- Station at the same elevation as West Broadway Ave bridges between northbound and southbound
- Grade separated from parkway
- Adds one signalized intersection south of station that connects to Lowry Ave through Washburn Ave.
- Slip ramp to Washburn Ave from northbound West Broadway Ave is removed.



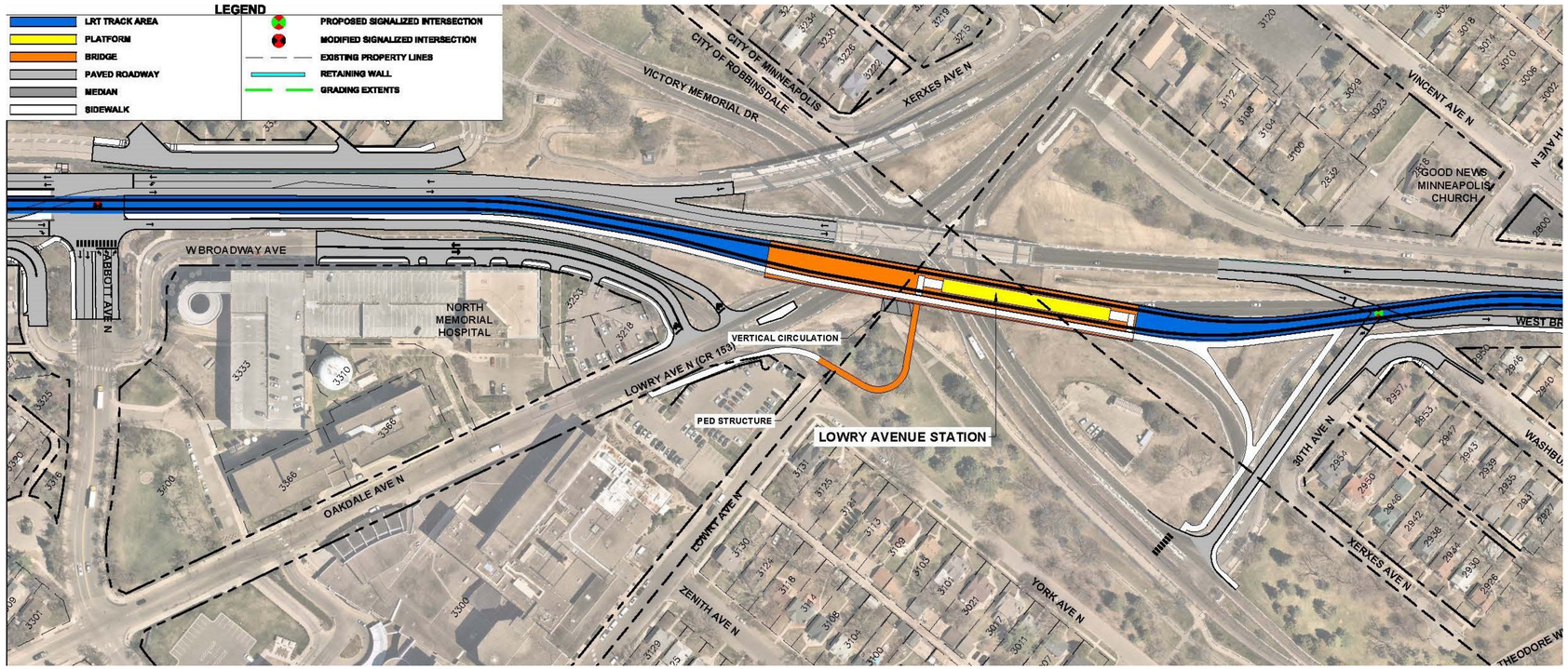
Better than option A About same as option A Worse than option A

LOWRY AVENUE STATION DESIGN OPTIONS

OPTION D2: LRT SIDE RUNNING AT THE SAME ELEVATION AS WEST BROADWAY AVE (CR 81) BRIDGES

	Option D2
Station accessibility, safety, experience	Elevated station requires several bridges to get transit riders to platform
Park and trail impacts	Parkway and trails do not cross LRT
Hospital traffic, access	No gated crossing of LRT, no interruption to hospital access
Area traffic operations, connectivity	Adds two LRT crossings on West Broadway, crossing at am angle creates driver safety concerns
Neighborhood connectivity	Elevated station disconnected from neighborhood
Impacts to new bridges	Southbound County Road 81 bridge is removed and replaced
Constructability, construction impacts	Constructability challenges with existing piling, moderately complex design
Cost	Higher cost

- Station at the same elevation as West Broadway bridges
- Grade separated from parkway
- Adds two at-grade signalized track crossings of West Broadway



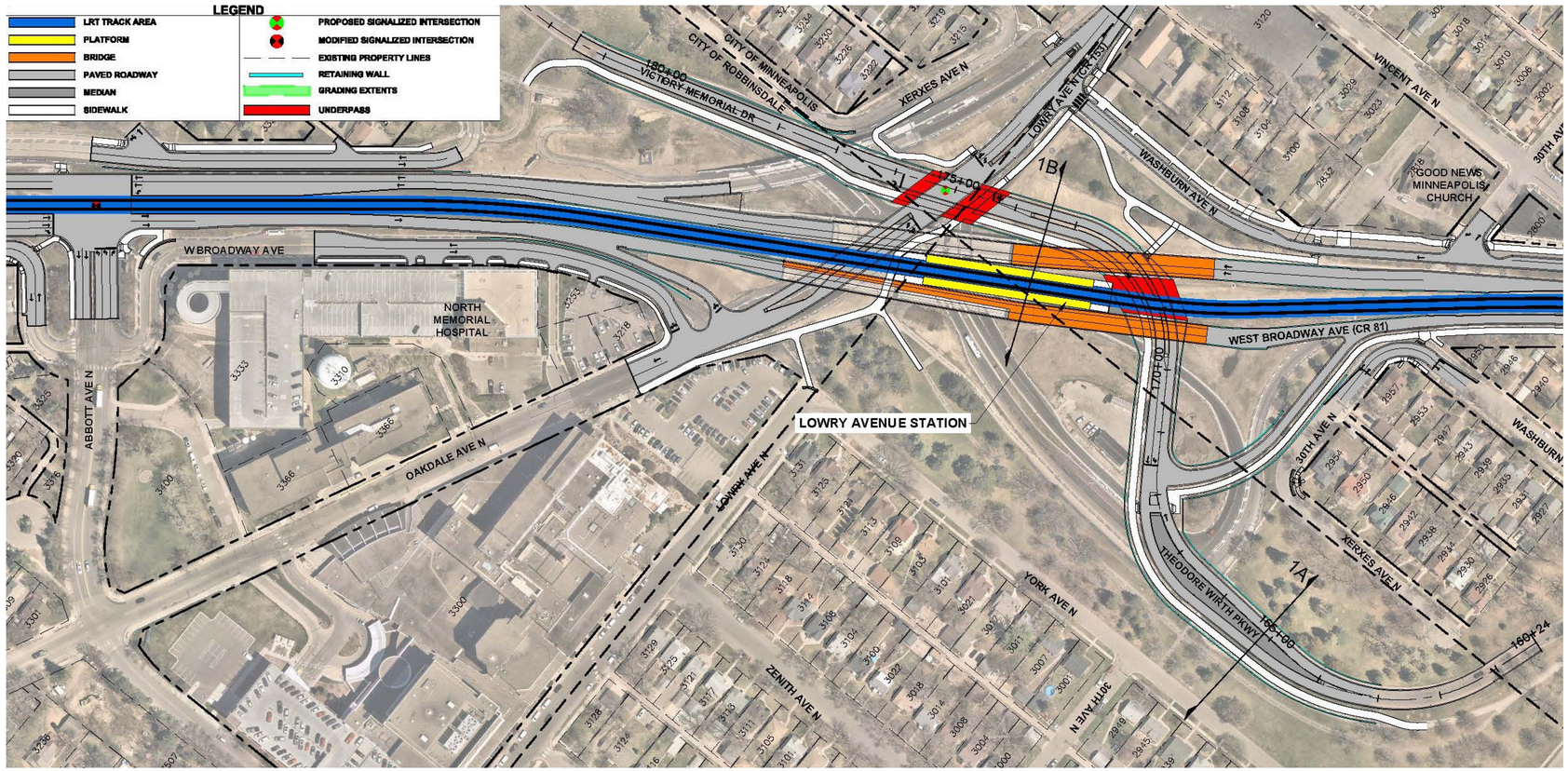
Better than option A | About same as option A | Worse than option A

LOWRY AVENUE STATION DESIGN OPTIONS

OPTION E: PARKWAY UNDER LRT

	Option E
Station accessibility, safety, experience	At-grade station maximizes accessibility, integrated station provides positive park user experience, visible platform improves safety
Park and trail impacts	Parkway and trails go under LRT in trench
Hospital traffic, access	No gated crossing of LRT, no interruption to hospital access
Area traffic operations, connectivity	No parkway connection at Lowry/County Road 81, good connection otherwise
Neighborhood connectivity	Station provides convenient access for neighborhoods
Impacts to new bridges	Maintains existing three bridges. Southbound County Road 81 bridge is modified to reduce overall width
Constructability, construction impacts	Significant construction disruptions/extended duration needed for retaining walls due to extensive construction
Cost	Higher cost

- Station stays at-grade
- Grade separated as parkway goes under the LRT
- Parkway goes under Lowry Ave as well, so a connection is no longer available



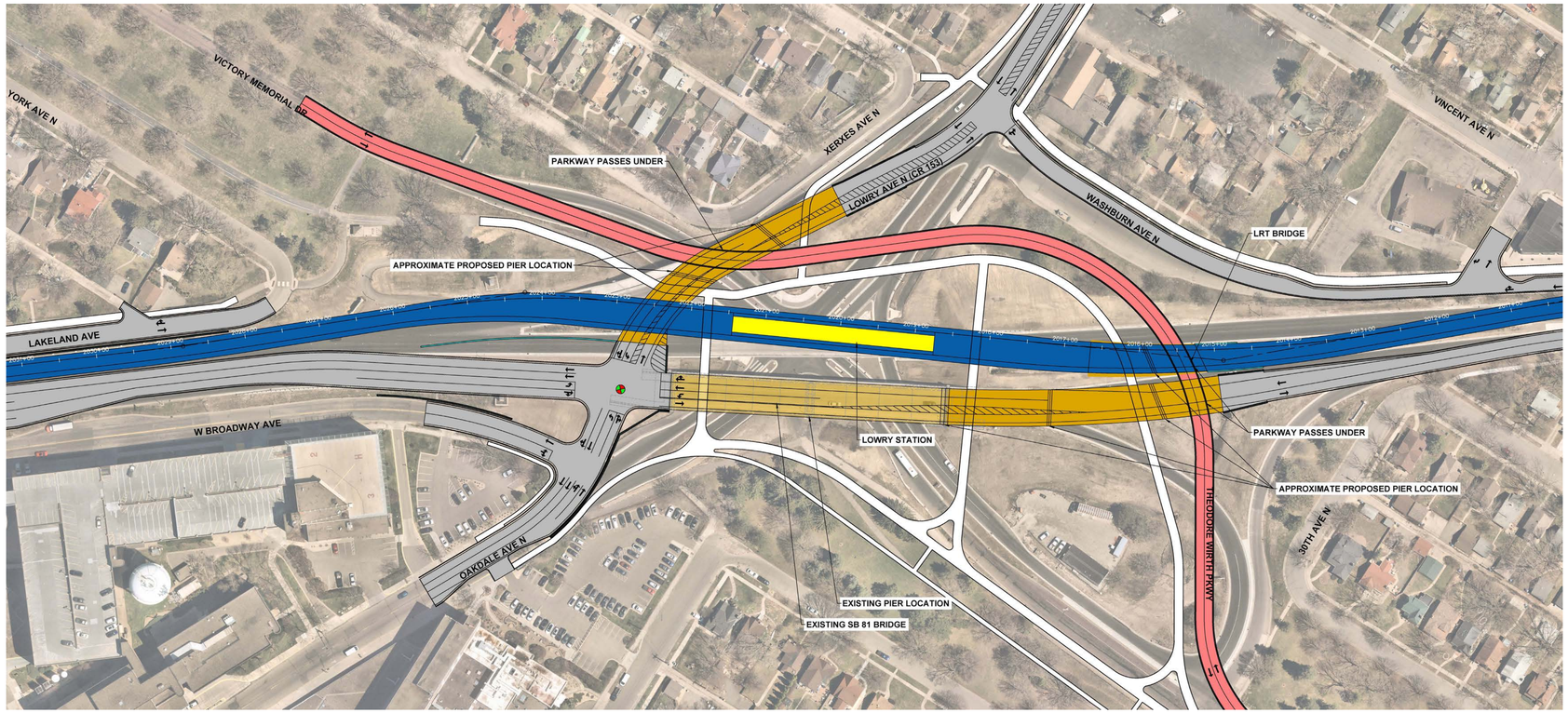
Better than option A | About same as option A | Worse than option A

LOWRY AVENUE STATION DESIGN OPTIONS

OPTION F: PARKWAY, TRAIL, AND LOWRY AVE UNDER LRT

	Option F
Station accessibility, safety, experience	At-grade station maximizes accessibility, integrated station provides positive park user experience, visible platform improves safety
Park and trail impacts	Parkway and trails do not cross LRT or Lowry
Hospital traffic, access	No gated crossing of LRT, no interruption to hospital access
Area traffic operations, connectivity	No parkway connection to Lowry/County Road 81, two LRT crossings on West Broadway
Neighborhood connectivity	Station provides convenient access for neighborhood, less roadway crossings to access station
Impacts to new bridges	Northbound County Road 81 and Lowry on-ramp bridges are removed and replaced, existing County Road 81 southbound bridge is re-used.
Constructability, construction impacts	Constructability challenges with existing piling and complexity of design, multiple additional years construction duration and disturbance
Cost	Higher cost

- Station at-grade at park level
- Parkway, trails, and Lowry are grade separated and go under LRT
- Northbound West Broadway Ave (CR 81) crosses and uses existing southbound West Broadway Ave Bridge



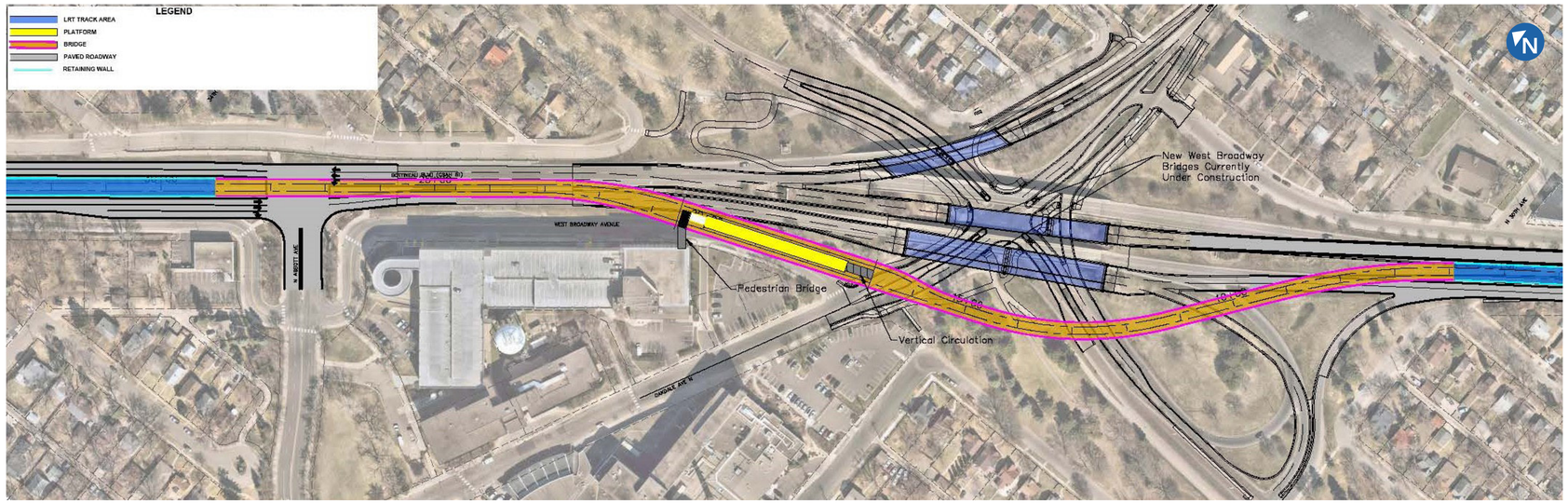
Better than option A | About same as option A | Worse than option A

LOWRY AVENUE STATION DESIGN OPTIONS

OPTION G: FLYOVER

	Option G
Station accessibility, safety, experience	Elevated station requires several bridges to get transit rider to platform
Park and trail impacts	Additional bridge detracts from park experience
Hospital traffic, access	No gated crossing of LRT, no interruption to hospital access
Area traffic operations, connectivity	Maintains existing roadway network
Neighborhood connectivity	Elevated station disconnected from neighborhood, farther distance for Minneapolis neighborhood
Impacts to new bridges	Keeps existing bridges
Constructability, construction impacts	Constructability challenges with existing piling and complexity of design due to height and length of bridge, multiple additional years construction duration and disturbance
Cost	Higher cost

- Station elevated above and around roadway network
- Grade separation from roadways



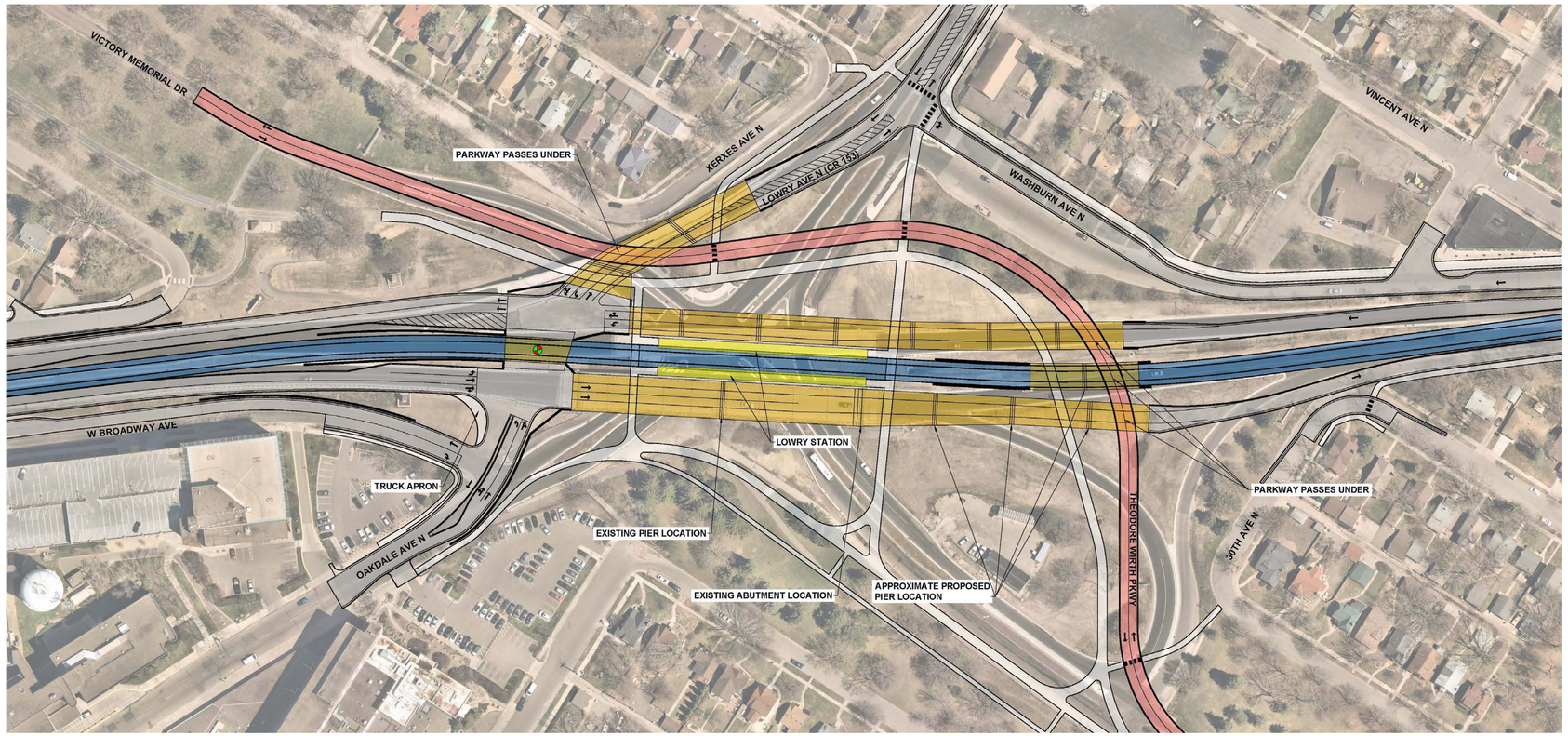
Better than option A | About same as option A | Worse than option A

LOWRY AVENUE STATION DESIGN OPTIONS

OPTION H: AT-GRADE STATION WITH NO CROSSINGS

	Option H
Station accessibility, safety, experience	At-grade station maximizes accessibility, integrated station provides positive park user experience, visible platform improves safety
Park and trail impacts	Parkway and trails do not cross LRT or Lowry
Hospital traffic, access	No gated crossings, no interruption to hospital access
Area traffic operations, connectivity	No parkway connection at Lowry/County Road 81, good connections otherwise
Neighborhood connectivity	Station provides convenient access for neighborhoods, less roadway crossings to access station
Impacts to new bridges	Northbound County Road 81 and Lowry on-ramp bridges are removed and replaced, keeps existing County Road 81 southbound bridge
Constructability, construction impacts	Extensive bridge constructability challenges with existing piling and complexity of design, multiple additional years construction duration and disturbance
Cost	Higher cost

- At-grade station
- No at-grade LRT crossings
- Removes and reconstructs 1 of 3 bridges over Lowry and adds 2 new bridges



Better than option A | About same as option A | Worse than option A

SUMMARY OF OPTIONS EVALUATED

	Option A – Municipal Consent Design	Option B	Option C	Option D1	Option D2	Option E	Option F	Option G	Option H
Station accessibility, safety, experience	At-grade station maximizes accessibility, integrated station within park provides positive user experience, visible platform improves safety	Underground station not visible from surrounding area, poor transit rider experience, no eyes on platform creates safety concerns	Station in trench and less visible from surrounding area, poor transit rider experience, less eyes on platform creates safety concerns	Elevated station requires several new bridges to get transit riders to platform	Elevated station requires several bridges to get transit riders to platform	At-grade station maximizes accessibility, integrated station provides positive park user experience, visible platform improves safety	At-grade station maximizes accessibility, integrated station provides positive park user experience, visible platform improves safety	Elevated station requires several bridges to get transit rider to platform	At-grade station maximizes accessibility, integrated station provides positive park user experience, visible platform improves safety
Park and trail impacts	Requires rerouting of parkway and trail, at-grade gated crossings of trail and parkway next to station. Creates additional park space.	Parkway and trails do not cross LRT	Parkway and trails do not cross LRT	Parkway and trails do not cross LRT	Parkway and trails do not cross LRT	Parkway and trails go under LRT in trench	Parkway and trails do not cross LRT or Lowry	Additional bridge detracts from park experience	Parkway and trails do not cross LRT or Lowry
Hospital traffic, access	Gated crossing at Oakdale/ Lowry may create average of 25 second delay on 10% of trips, could be mitigated by alternate wayfinding/routing for hospital	No gated crossings, no interruption to hospital access	No gated crossings, no interruption to hospital access	No gated crossings, no interruption to hospital access	No gated crossing of LRT, no interruption to hospital access	No gated crossing of LRT, no interruption to hospital access	No gated crossing of LRT, no interruption to hospital access	No gated crossing of LRT, no interruption to hospital access	No gated crossings, no interruption to hospital access
Area traffic operations, connectivity	Maintains existing road network	Roadway connections same as existing	Roadway connections same as existing	Adds a traffic signal south of the station at Washburn	Adds two LRT crossings on West Broadway, crossing at angle creates driver safety concerns	No parkway connection at Lowry/County Road 81, good connection otherwise	No parkway connection to Lowry/County Road 81, two LRT crossings on W Broadway	Maintains existing roadway network	No parkway connection at Lowry/County Road 81, good connections otherwise
Neighborhood connectivity	Station provides convenient access for neighborhoods	Underground station disconnected visually from surrounding neighborhood	Station in trench and disconnected visually from surrounding neighborhood	Elevated station disconnected from neighborhood	Elevated station disconnected from neighborhood	Station provides convenient access for neighborhoods	Station provides convenient access for neighborhood, less roadway crossings to access station	Elevated station disconnected from neighborhood, farther distance for Minneapolis neighborhood	Station provides convenient access for neighborhoods, less roadway crossings to access station
Impacts to new bridges	Keeps existing three bridges but modifies southbound County Road 81 bridge to reduce overall width	Southbound and northbound County Road 81 bridges are removed and replaced	Southbound and northbound County Road 81 bridges are removed and replaced	Southbound County Road 81 bridge is removed and replaced	Southbound County Road 81 bridge is removed and replaced	Maintains existing three bridges; southbound County Road 81 bridge is modified to reduce overall width	Northbound County Road 81 and Lowry on-ramp bridges are removed and replaced, existing County Road 81 southbound bridge is re-used	Keeps existing bridges	Northbound County Road 81 and Lowry on-ramp bridges are removed and replaced; keeps existing County Road 81 southbound bridge
Constructability, construction impacts	Less complex foundation construction	Constructability challenges with existing piling and complexity of design, multiple additional years construction duration and disturbance	Constructability challenges with existing piling and complexity of design, multiple additional years construction duration and disturbance	Constructability challenges with existing pilling, moderately complex design	Constructability challenges with existing piling, moderately complex design	Significant construction disruptions/extended duration needed for retaining walls due to extensive construction	Constructability challenges with existing piling and complexity of design, multiple additional years construction duration and disturbance	Constructability challenges with existing piling and complexity of design due to height and length of bridge, multiple additional years construction duration and disturbance	Extensive bridge constructability challenges with existing piling and complexity of design, multiple additional years construction duration and disturbance
Cost	Comparatively lower cost	Very high cost	Very high cost	Comparatively lower cost	Higher cost	Higher cost	Higher cost	Higher cost	Higher cost

Better than option A About same as option A Worse than option A

ROUTING TO NORTH MEMORIAL HOSPITAL

MUNICIPAL CONSENT DESIGN, AT-GRADE STATION AND CROSSING (OPTION A)

- To avoid LRT crossing gates, emergency service and personal vehicles driving to and from North Memorial Hospital can use Abbott Ave N via West Broadway/ Bottineau Blvd.
  - » Gates are only expected to be down 10% of the time.
- Hospital wayfinding signage will be installed along the route to guide vehicles.