NM 14/NM 536/Frost Rd Intersection Reconstruction CN A301442

PUBLIC INFORMATION MEETING

March 16, 2022

Bohannan Huston

U.S. Department of Transportation
Federal Highway Administration

New Mexico DEPARTMENT OF TRANSPORTATION
MOBILITY FOR EVERYONE

VIRTUAL MEETING PROTOCOL

- Please stay muted during the presentation.
- Please turn off your camera.
- Following the presentation there will be a Q&A session at which time directions will be provided on how to share comments.
- Meeting is being recorded for future playback and will be provided on the project web page along with a PDF of the presentation: https://nm14sanantonito.nmdotprojects.org/

AGENDA

1. Project Timeline
2. Proposed Intersection Layout
3. Access Improvements
4. Intersection Capacity
5. Pedestrian & Bicycle Access
6. Safety
7. Sustainable Stormwater Design
8. Temporary Traffic Control
9. Drive-Thru Simulation Video
10. Next Steps
11. Questions

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Project Timeline

2016

Summer
Phase 1A-B Study Initiated

2017

Summer
First In-Person Public Meeting

2018

Spring
Phase 1A-B Study Complete

Phase 1
Pavement Rehabilitation Complete (MP 0-2)

2019

Phase 2
Pavement Rehabilitation Complete (MP 2-4)

2020

Phase 3
Pavement Rehabilitation Complete (MP 4-5.75)

2021

Fall
Intersection Design Begins (Phase 5)

Spring
Maintenance Fog Seal Complete

2022

Spring
Phase 5 Virtual Public Meeting

Phase 4
Slope Erosion Mitigation Construction Scheduled (Summer)

2023

Fall
Phase 5 Intersection Construction Scheduled

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Proposed Intersection Layout

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Existing Intersection

NM 14

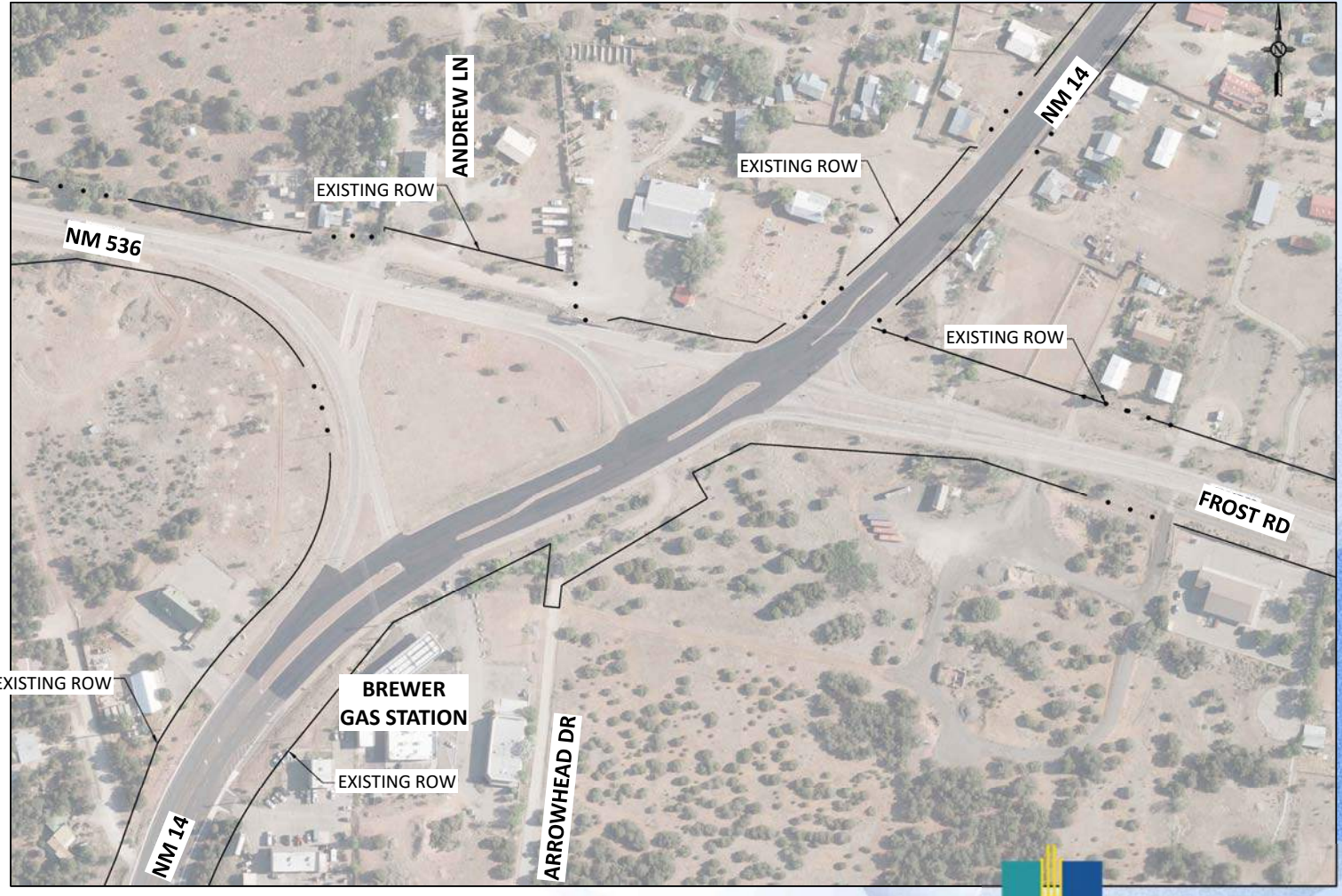
- Runs north from I-40 up to Santa Fe
- Four-lane section
- S-curve through the intersection

NM 536

- Runs from Sandia Peak down to the intersection
- Two-lane section
- Separated entrance/exit roads off NM 14

Frost Road

- Runs from the intersection east to NM 344
- Two-lane section



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NM 14 (South Leg)

- Transition to one lane at intersection approach
- Slight realignment to the northwest

NM 536

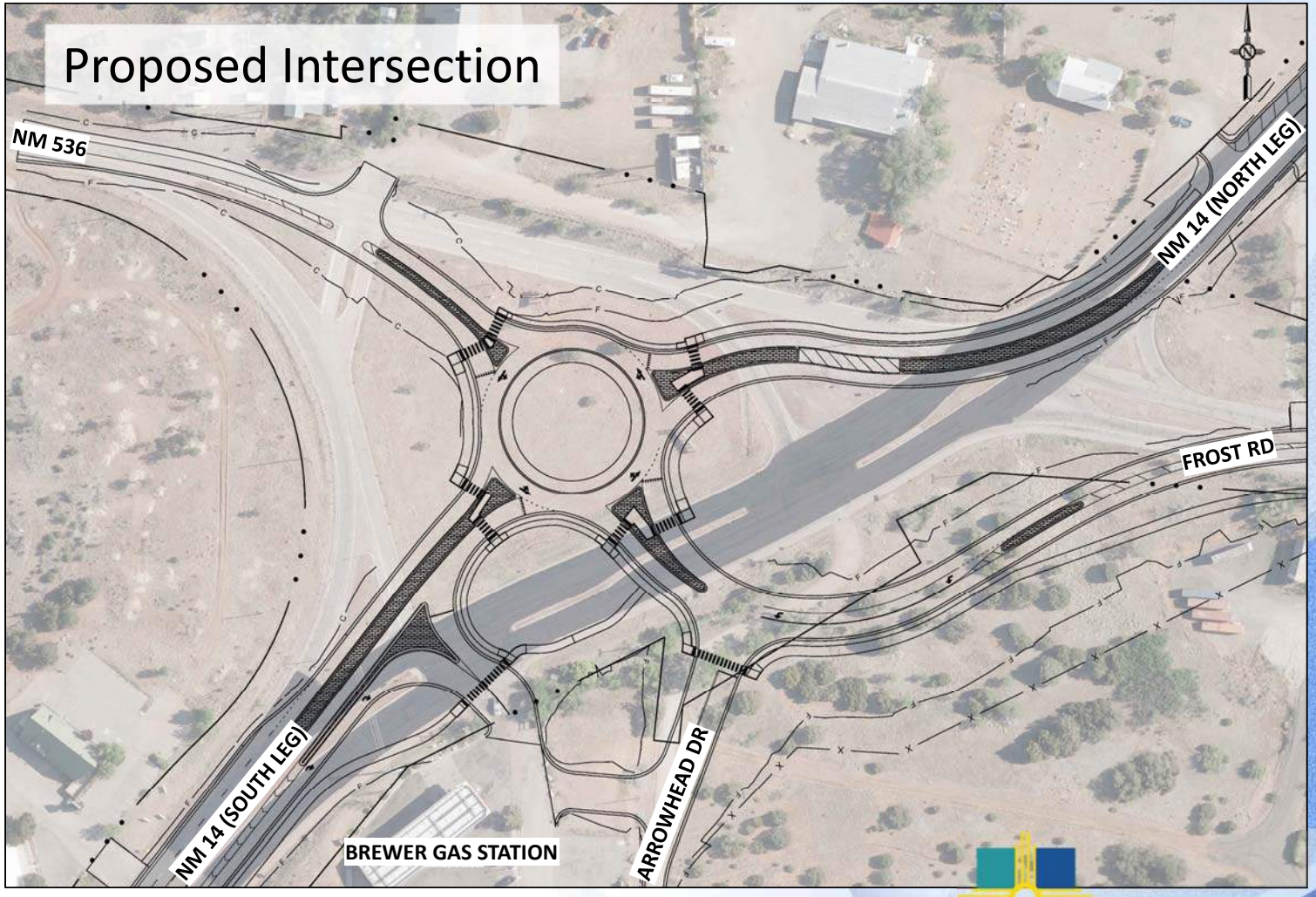
- Separated entrance/exit roads will be consolidated into a single access point
- Slight realignment to the south

NM 14 (North Leg)

- Transition to one lane at intersection approach
- Realignment to the north and west

Frost Road

- Realignment to the south and west



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Access Improvements

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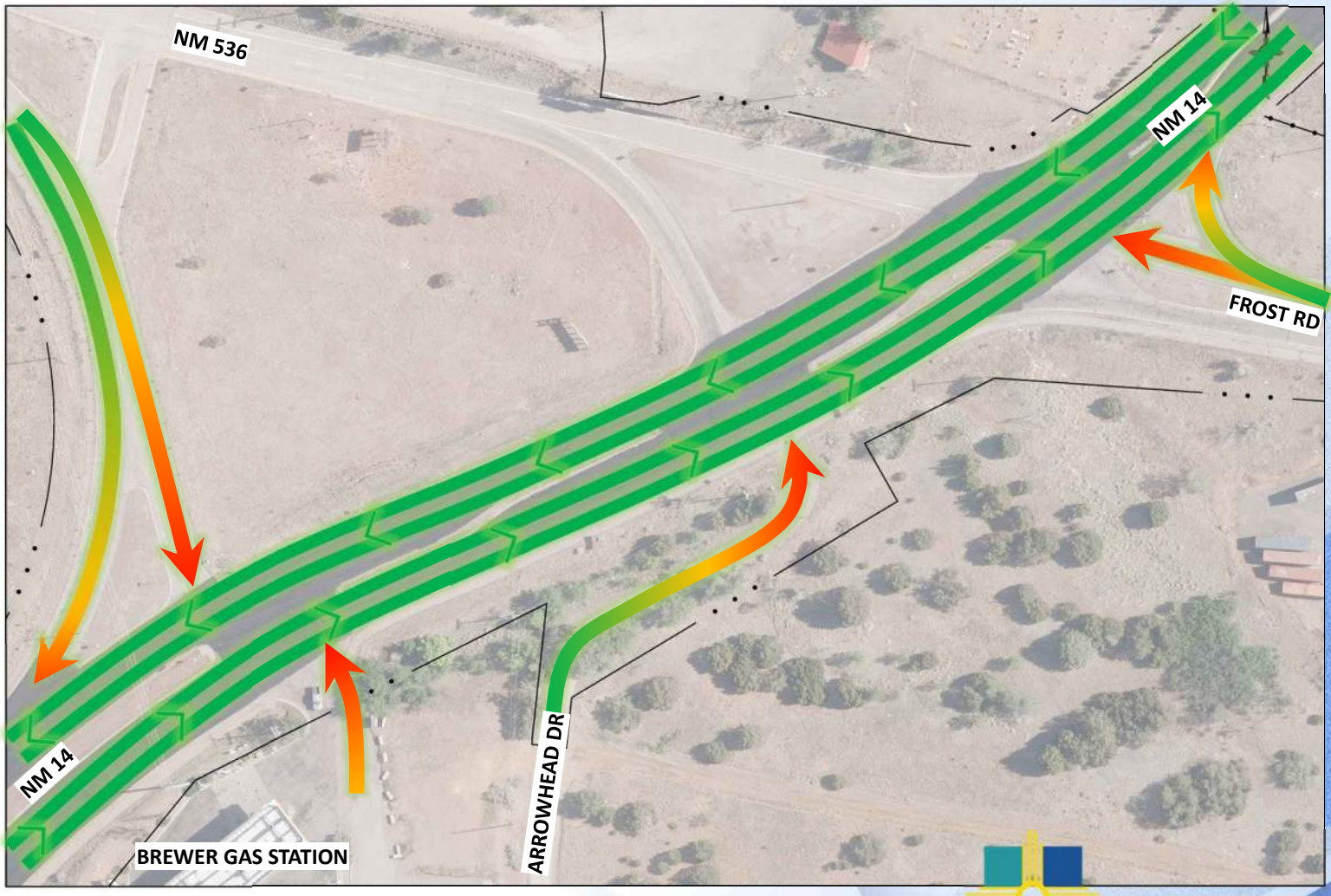
Existing Access Concerns

- Left turn movements onto NM 14 are a concern due to a saturation of access points within the intersection
- Traffic stopped on minor roads must cross multiple lanes to turn left onto NM 14
- Existing conditions favor traffic on NM 14 as the main thoroughfare whereas commuters on minor roads must stop and wait or yield



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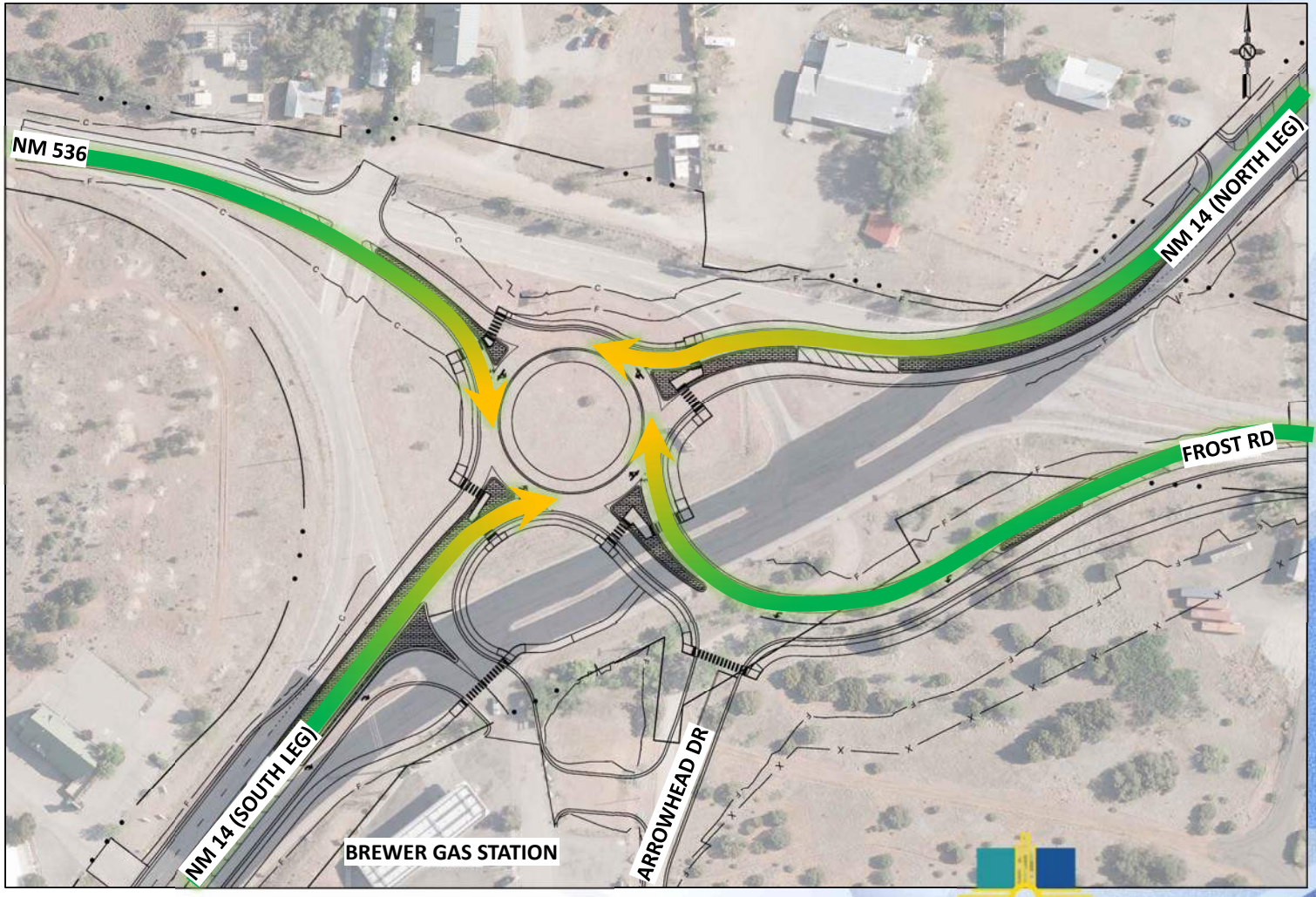
Proposed Access

- Access spacing is consolidated by utilizing the roundabout as the central access point
- All approach legs will consist of a single lane
- Driveways to the San Antonito Church, Vista Grande Church, Andrew Ln, and other residents within the project area will be maintained.



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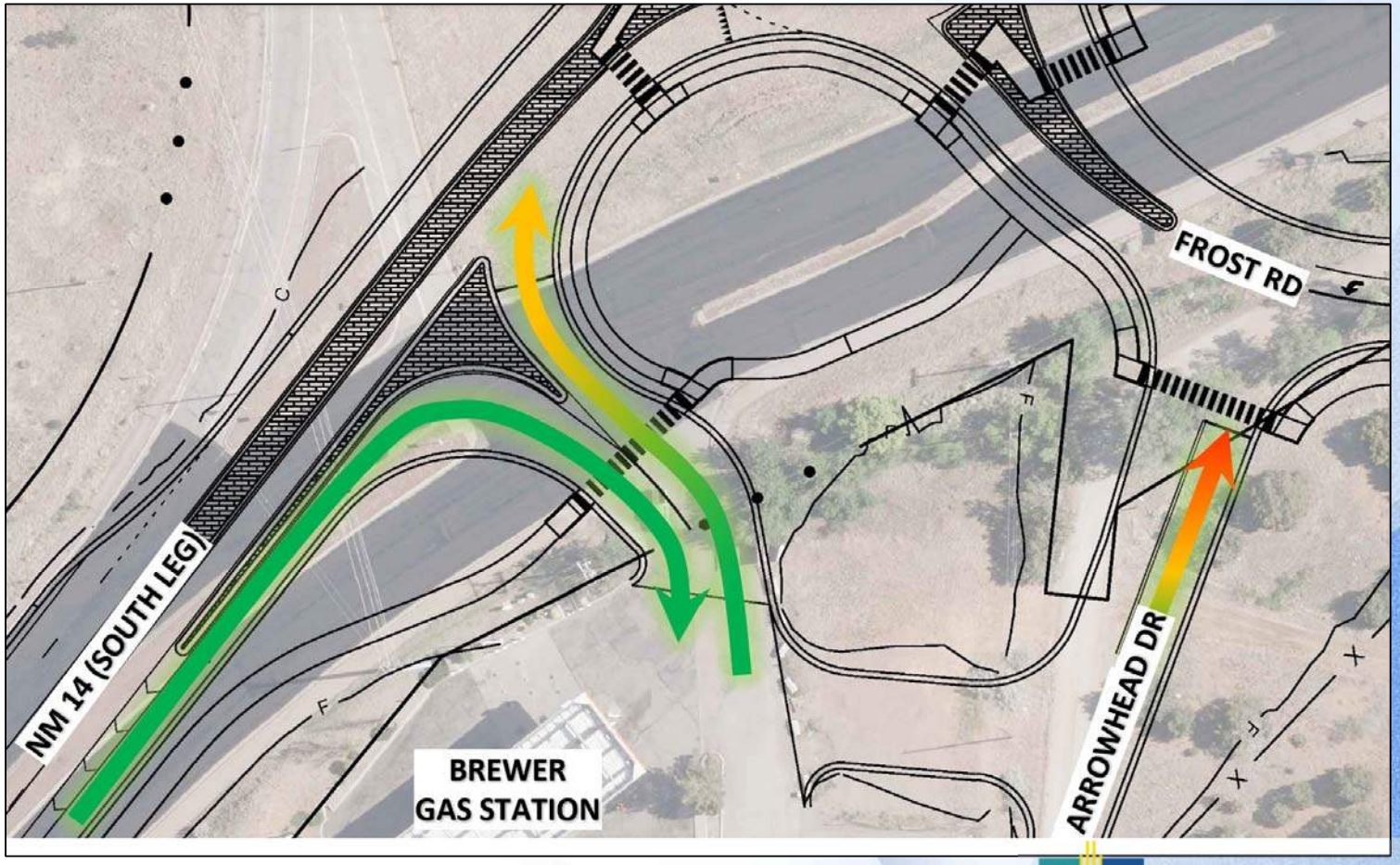
Proposed Access

- Brewer gas station access will become a “right-in/right-out” along NM 14, but will also have a new access from Arrowhead Drive
- Arrowhead Drive is now accessed from Frost Road



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Intersection Capacity

Highway Capacity Manual, 6th edition

- Summary of Exhibit 19-8 (Signalized Intersections) vs. Exhibit 20-20 (Unsignalized Intersections)

Table 1 – LOS Definitions			
Level of Service	Definition	Signalized (sec/veh)	Unsignalized (sec/veh)
A	Most vehicles do not stop.	<10	<10
B	Some vehicles stop.	>10 and <20	>10 and <15
C	Significant numbers of vehicles stop.	>20 and <35	>15 and <25
D	Many vehicles stop.	>35 and <55	>25 and <35
E	Limit of acceptable delay.	>55 and <80	>35 and <50
F	Unacceptable delay.	>80	>50

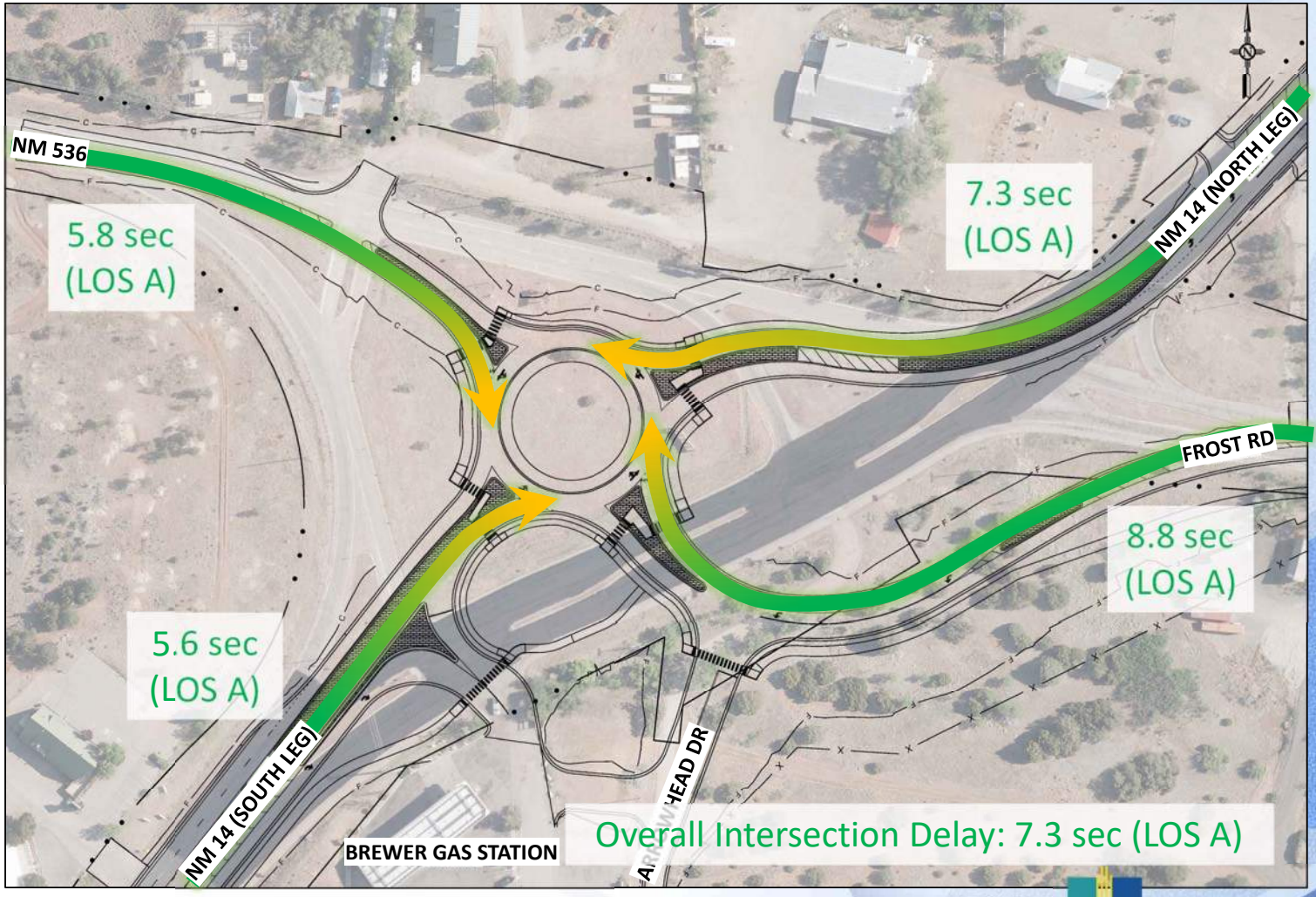
NCHRP Report 672 (2nd ed)
Roundabouts: An Informational Guide

- Section 2.2.3.1

  "When operating within their capacity, roundabouts typically operate with lower vehicle delays than other intersection forms and control types. With a roundabout, it is unnecessary for traffic to come to a complete stop when no conflicts are present. When there are queues on one or more approaches, traffic within the queues usually continues to move, and this is typically more tolerable to drivers than a stopped or standing queue. The performance of roundabouts during off-peak periods is particularly good compared with other intersection forms, usually with very low average delays."

AM Peak Hour
Existing Conditions

- All legs of the intersection operate at LOS A (most vehicles do not stop) during morning rush hour.
- Overall intersection operates at LOS A



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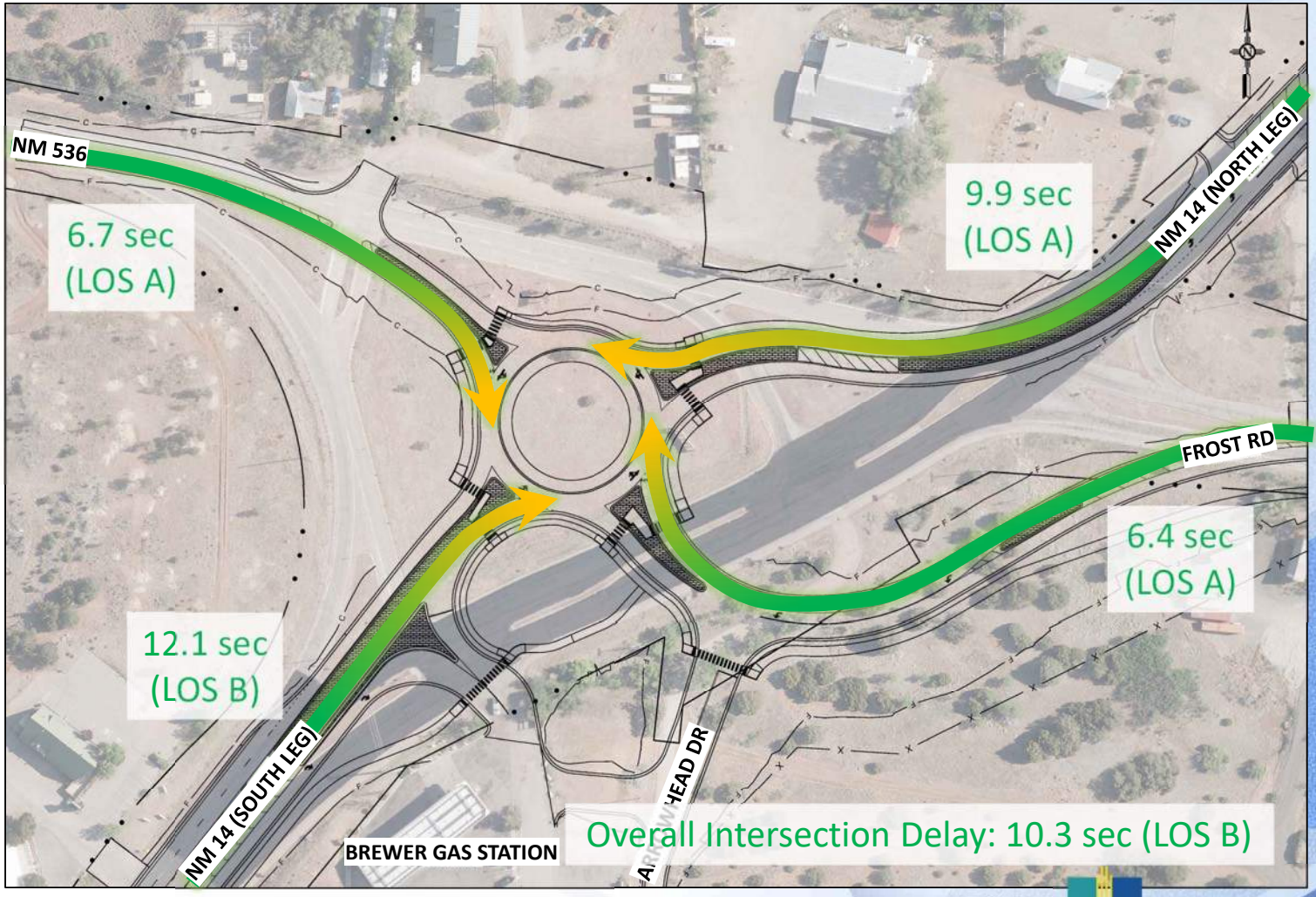
PM Peak Hour
Existing Conditions

- NM 536, NM 14 southbound, and Frost Road operate at LOS A (most vehicles do not stop) during afternoon rush hour
- NM 14 northbound operates at LOS B (some vehicles stop)
- Overall intersection operates at LOS B



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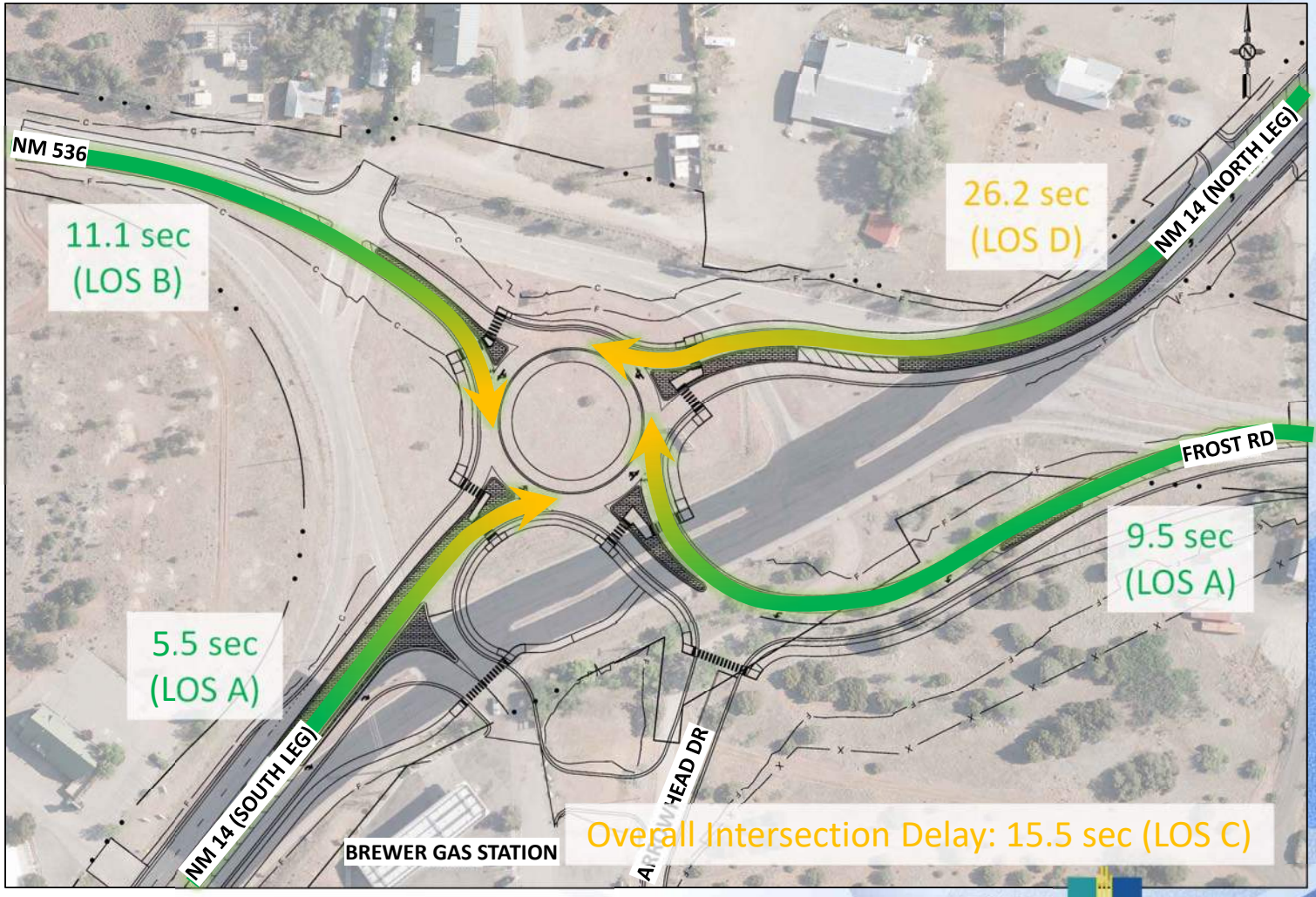
AM Peak Hour
Future Conditions (20 years)

- NM 14 northbound, and Frost Road operate at LOS A (most vehicles do not stop) during morning rush hour
- NM 536 operates at LOS B (some vehicles stop)
- NM 14 southbound operates at LOS D (many vehicles stop)
- Overall intersection operates at LOS C (significant number of vehicles stop)



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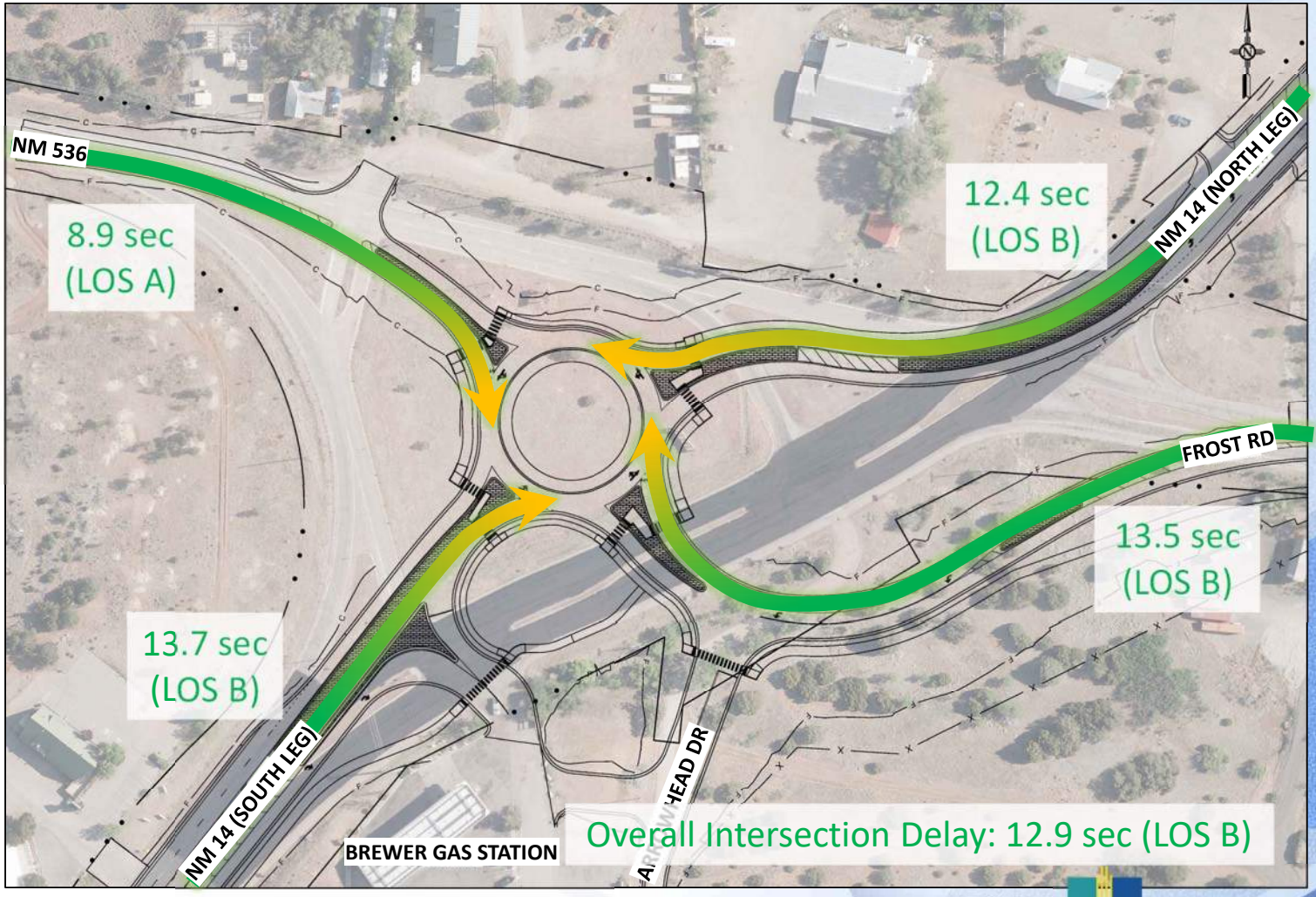
PM Peak Hour
Future Conditions (20 years)

- NM 536 operates at LOS A (most vehicles do not stop) during afternoon rush hour
- NM 14 (both directions) and Frost Road operate at LOS B (some vehicles stop)
- Overall intersection operates at LOS B



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NCHRP Report 672 (2nd ed)
Roundabouts: An Informational Guide

- 4-Legged Single Lane Roundabouts can service up to approximately 25,000 vehicles per day
- 2019 traffic data (pre-pandemic) shows 8,562 vehicles per day traveling through the intersection
- 20-year traffic projections (accounting for growth) are expected to be 11,086 vehicles per day

Exhibit 1-9
Roundabout Category Comparison

Design characteristics of the three roundabout categories.

Design Element	Mini-Roundabout	Single-Lane Roundabout	Multilane Roundabout
Desirable maximum entry design speed	15 to 20 mph (25 to 30 km/h)	20 to 25 mph (30 to 40 km/h)	25 to 30 mph (40 to 50 km/h)
Maximum number of entering lanes per approach	1	1	2+
Typical inscribed circle diameter	45 to 90 ft (13 to 27 m)	90 to 180 ft (27 to 55 m)	150 to 300 ft (46 to 91 m)
Central island treatment	Fully traversable	Raised (may have traversable apron)	Raised (may have traversable apron)
Typical daily service volumes on 4-leg roundabout below which may be expected to operate without requiring a detailed capacity analysis (veh/day)*	Up to approximately 15,000	Up to approximately 25,000	Up to approximately 45,000 for two-lane roundabout

*Operational analysis needed to verify upper limit for specific applications or for roundabouts with more than two lanes or four legs.

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NCHRP Report 672 (2nd ed)
Roundabouts: An Informational Guide

- Section 2.2.3

"The operation of vehicular traffic at a roundabout is determined by gap acceptance: entering vehicles look for and accept gaps in circulating traffic. The low speeds of a roundabout facilitate this gap acceptance process. Furthermore, the operational efficiency (capacity) of roundabouts is greater at lower circulating speed because of the following two phenomena:

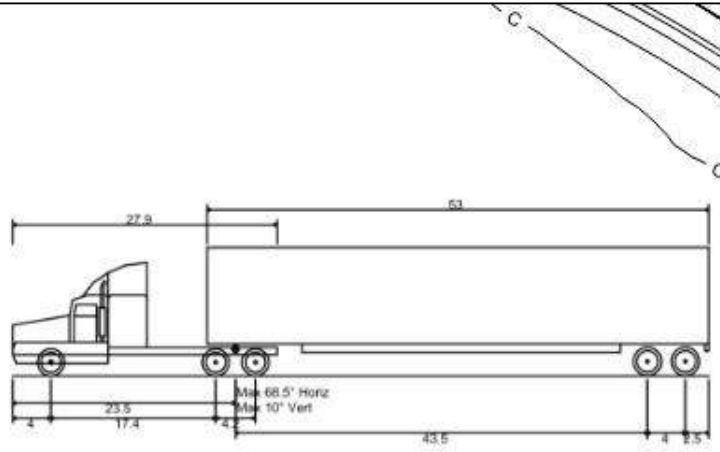
1. *The faster the circulating traffic, the larger the gaps that entering traffic will comfortably accept. This translates to fewer acceptable gaps and therefore more instances of entering vehicles stopping at the yield line.*
2. *Entering traffic, which is first stopped at the yield line, requires even larger gaps in the circulating traffic in order to accelerate and merge with the circulating traffic. The faster the circulating traffic, the larger this gap must be. This translates into fewer acceptable gaps and therefore longer delays for entering traffic."*

- Section 2.2.4

"Roundabouts…produce efficiency through a gap acceptance process. While the capacity for through traffic is limited by conflicting circulatory flow, drivers can accept gaps as they appear rather than waiting for their time in the cycle."

Design Vehicles

- WB-67 – Interstate Semi-Trailer
- Can navigate through intersection utilizing the truck apron



WB-67 - Interstate Semi-Trailer	
Overall Length	73.501ft
Overall Width	8.500ft
Overall Body Height	13.500ft
Min Body Ground Clearance	1.334ft
Max Track Width	8.500ft
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	28.40°

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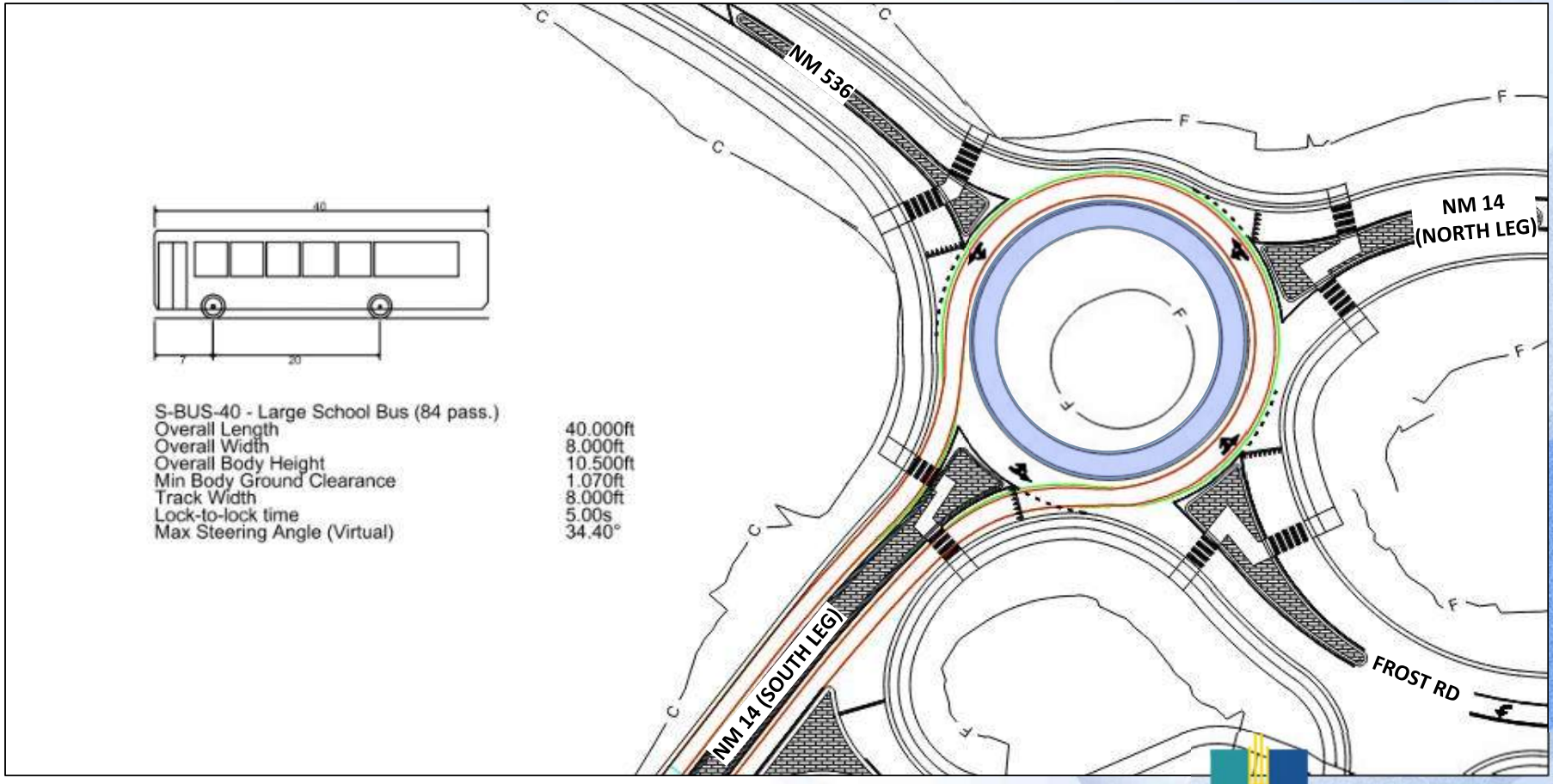
Design Vehicles

- S-Bus-40 – Large School Bus (84 pass.)
- Can navigate through intersection without utilizing truck apron (including emergency vehicles)



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Pedestrian & Bicycle Access

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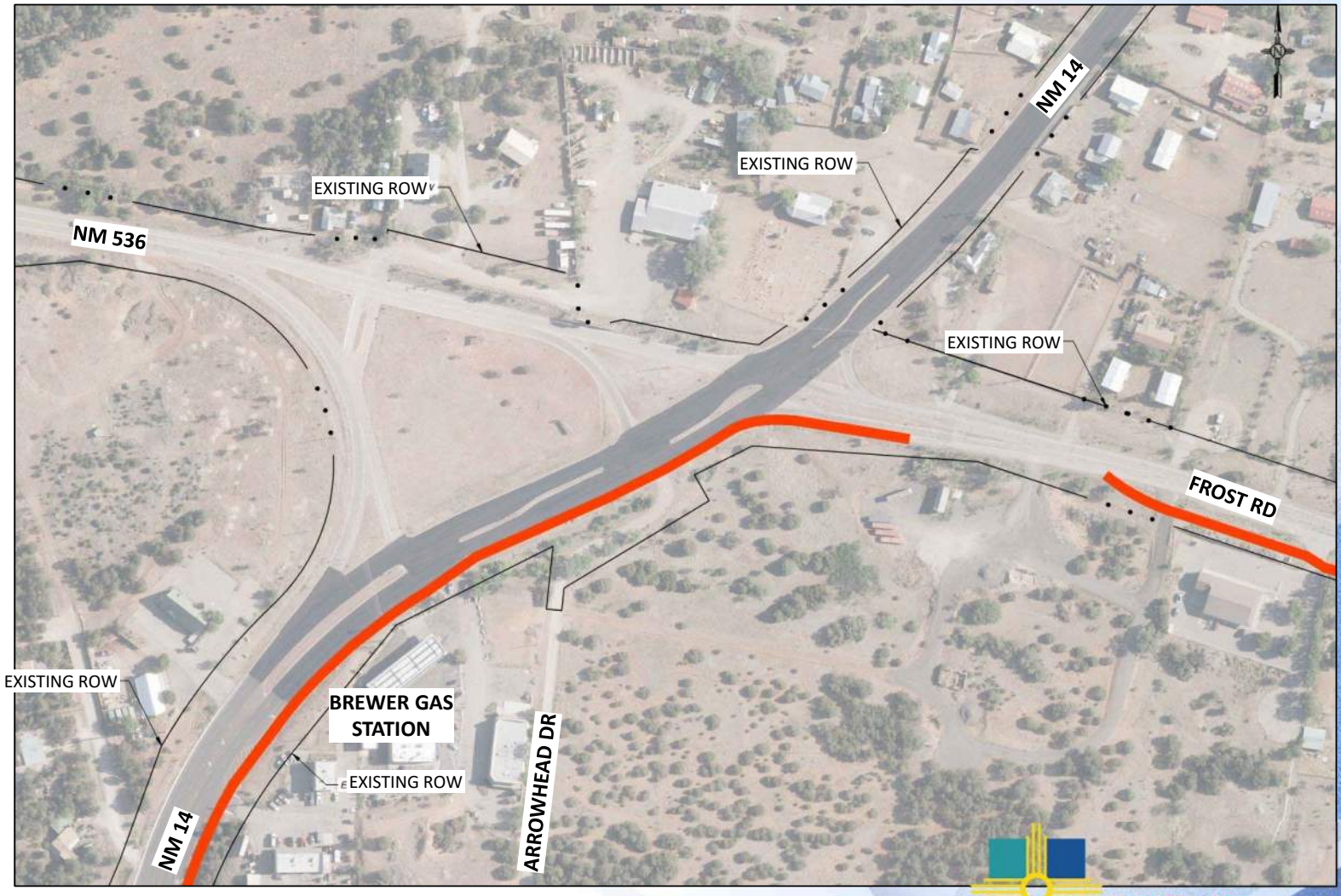
Existing Conditions

- Multi-Use Path along east side of NM 14 ends at Frost Rd
- 300’ gap (no path)
- Multi-Use Path picks up again on Frost Rd and continues east



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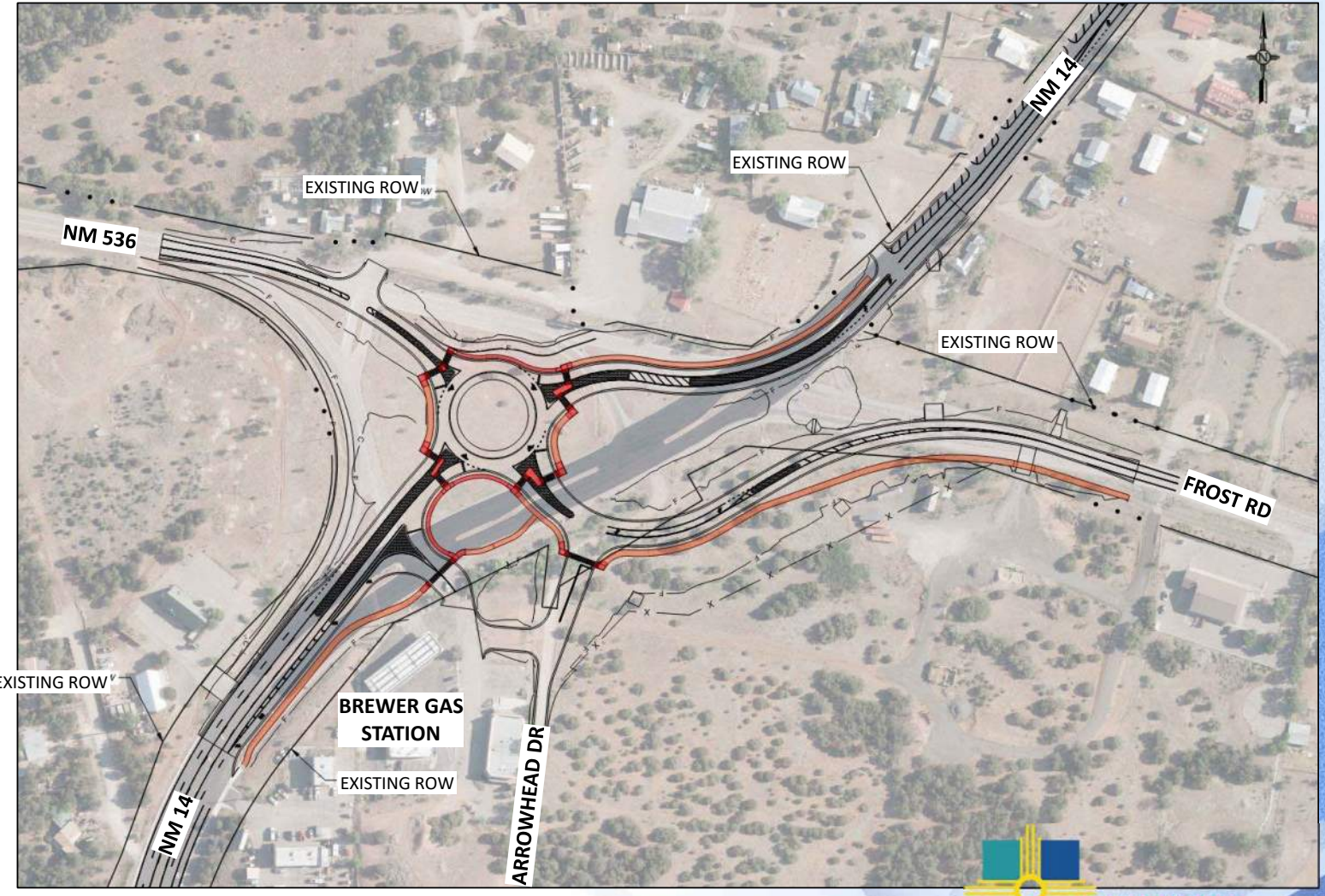
Proposed Conditions

- New Multi-Use Path will continue along east side of NM 14 and connect to existing Frost Rd path
- Sidewalks and Multi-use Paths will allow full pedestrian access through the intersection
- New Multi-Use Path connection up to San Antonito Catholic Church on west side of NM 14
- Future connection to San Antonito Elementary School through Bernalillo County Public Works Project
- Bicyclists can utilize new Sidewalk/Multi-Use Path system or share the road



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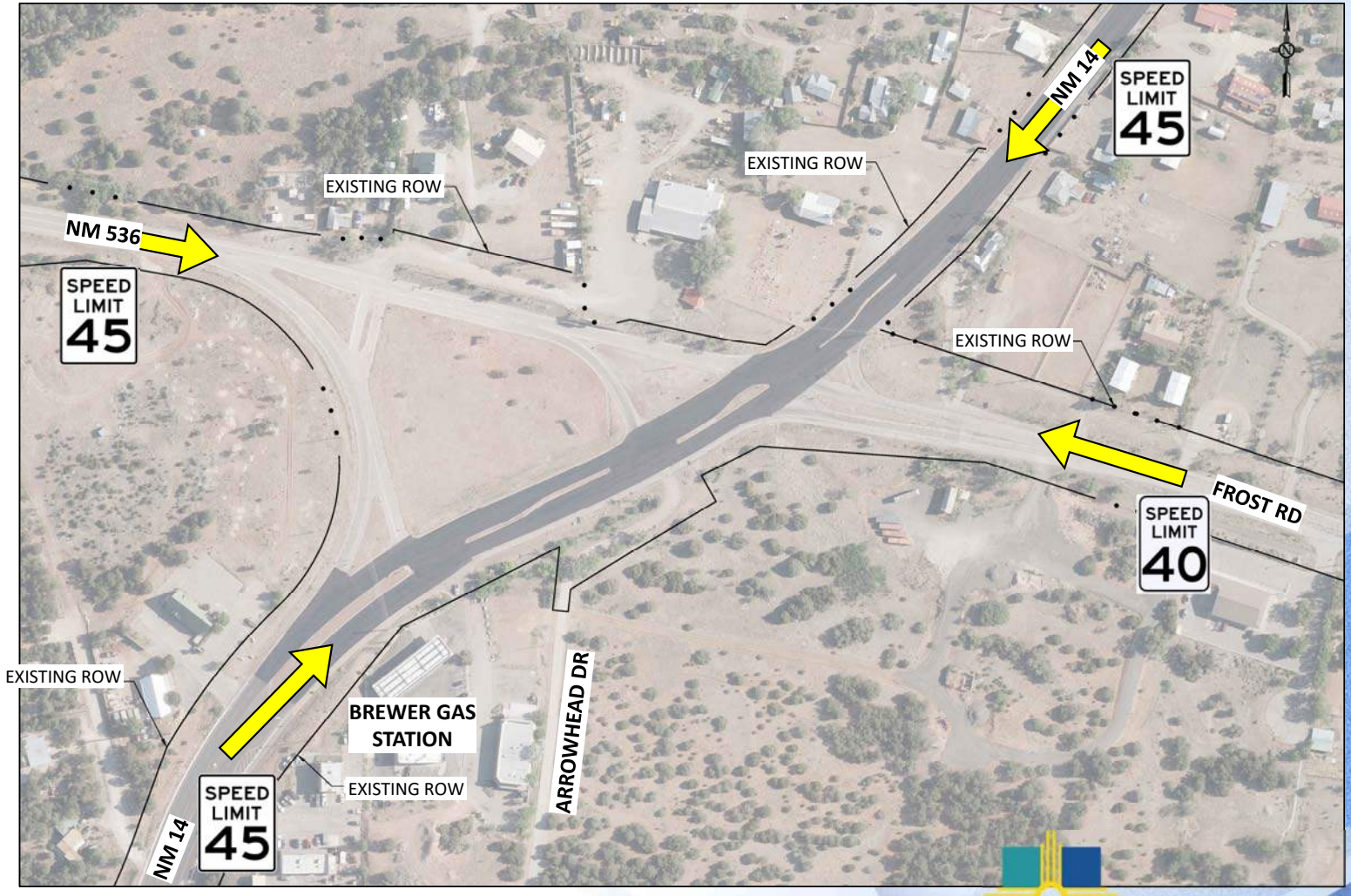
Safety

Existing Approach Speeds

- Today, roadways through the intersection have a posted speed limit of 45 MPH except for Frost Road which is posted at 40 MPH.



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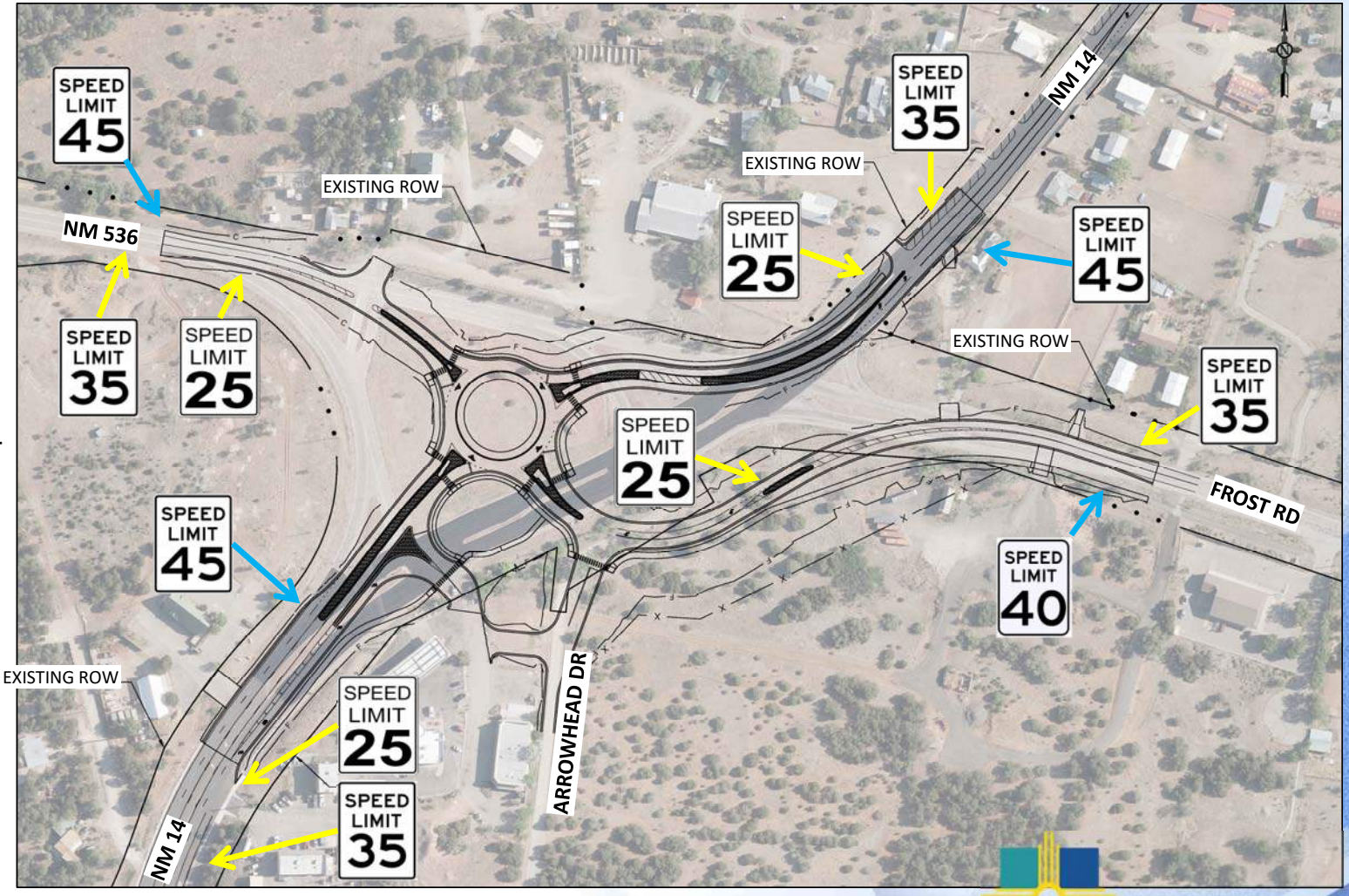
Proposed Approach Speeds

- All posted speeds will be reduced from 45 MPH > 35 MPH > 25 MPH for all approaches to the roundabout
- Roundabout geometry was designed to accommodate circulating speeds between 15mph – 25mph
- Slower speeds improve roundabout capacity by allowing greater gap acceptance
- Speed limits will be increased upon exiting the roundabout.



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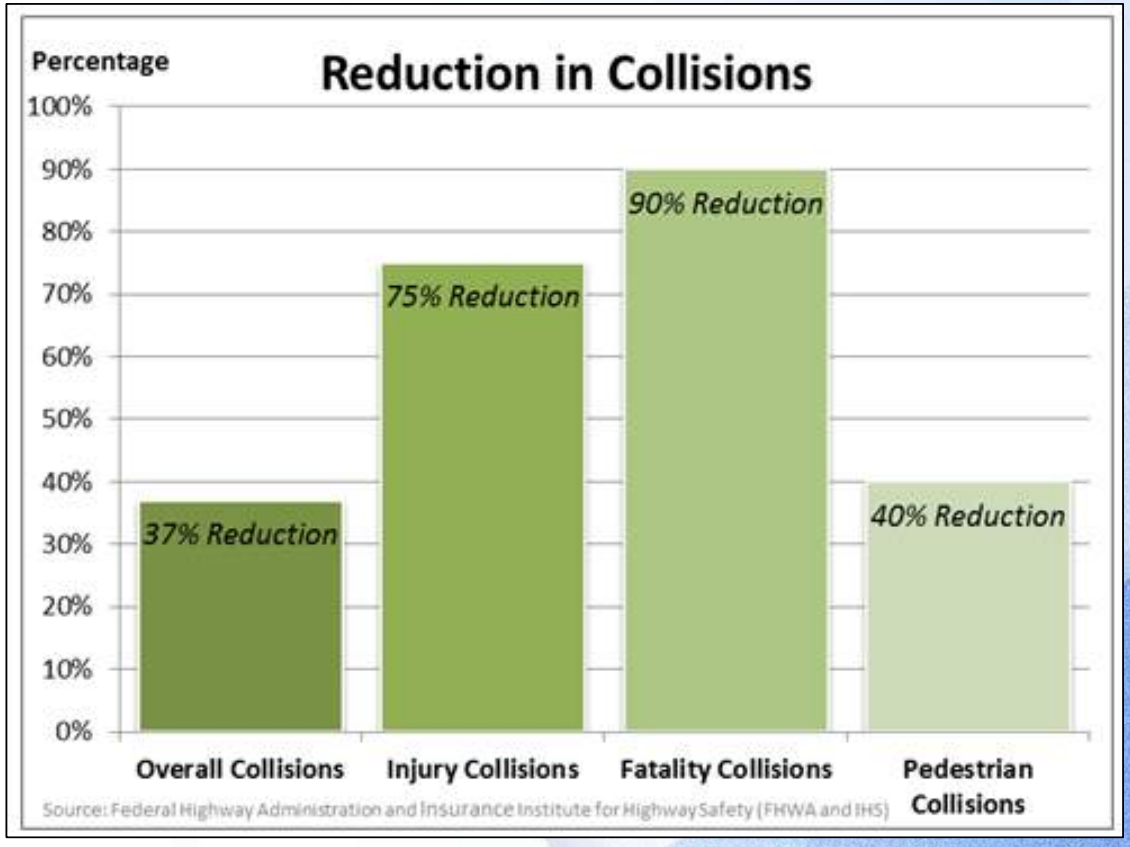
Collision Reductions

According to a study by the Insurance Institute for Highway Safety (IIHS) and Federal Highway Administration (FHWA), the use of a roundabouts in place of a stop-controlled or signalized intersection will:

- Reduce fatal collisions by 90%
- Reduce injury collisions by 75%
- Reduce pedestrian collisions by 40%
- 37% Reduction in overall collisions

Reasons for these reductions include:

- Lower travel speeds through the intersection
- No more incentive to “beat the light”
- Gentle crossing angles
- One-way travel



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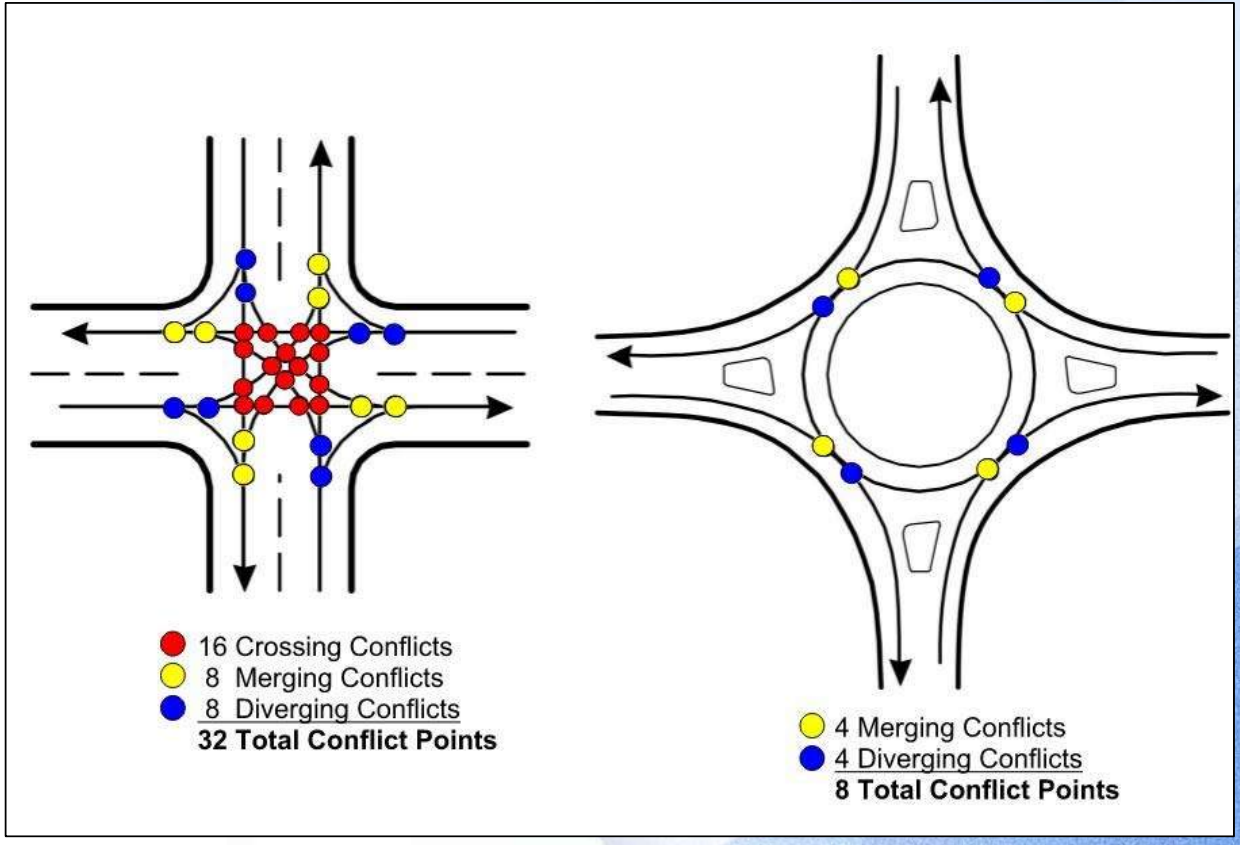
Vehicle Conflict Points

Comparison of Traditional Intersection vs. Roundabout with single-lane approaches

- Diverging Conflicts:
  - Caused by the separation of two traffic streams
  - Higher speed differentials increase risk of rear-end collision (low severity)
- Merging Conflicts:
  - Caused by the joining of two traffic streams
  - Higher possibility of collision to the side of the vehicle (medium severity)
- Crossing Conflicts:
  - Occur where the path of two streams intersect
  - High risk of right-angle crashes and head-on crashes (most severe)



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NCHRP Report 672 (2nd ed)
Roundabouts: An Informational Guide

- Section 8.2

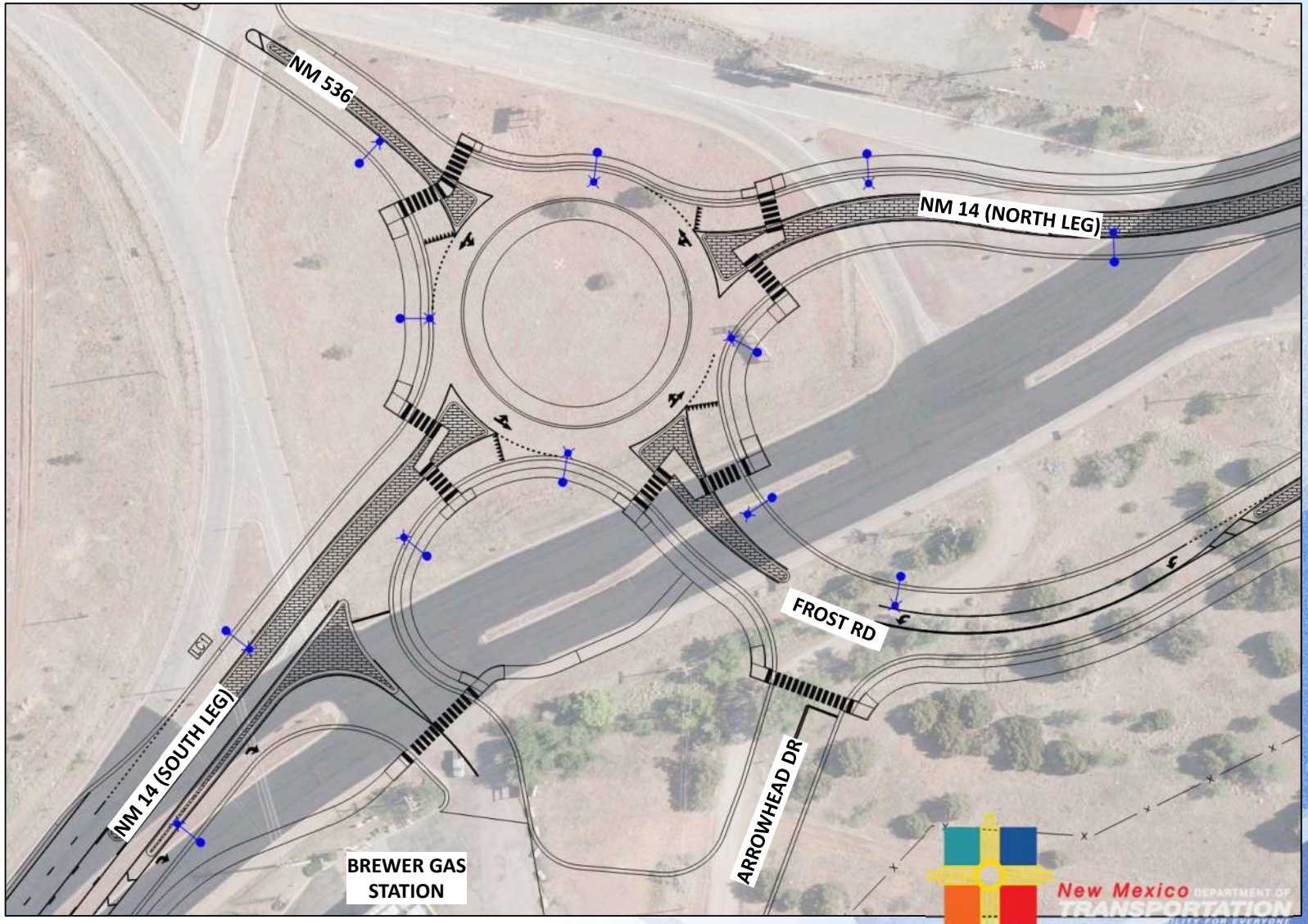
"Lighting of roundabouts serves two main purposes:

1. *It provides visibility from a distance for users approaching the round-about; and*
2. *It provides visibility of the key conflict areas to improve users' perception of the layout and visibility of other users within the roundabout.*

An important lighting consideration at roundabouts is that the roundabout introduces geometry and channelization that a driver may not expect unless it is visible at all times. In addition, the effectiveness of auto headlights is limited in a roundabout due to the constrained curve radius, making the roadway lighting system very important for nighttime visibility of obstructions and hazard"

Intersection Lighting Layout

- Existing lights will be removed from intersection
- New light poles will be installed
- Light poles will be 30’ high
- All lighting will comply with New Mexico Night Sky Protection Act



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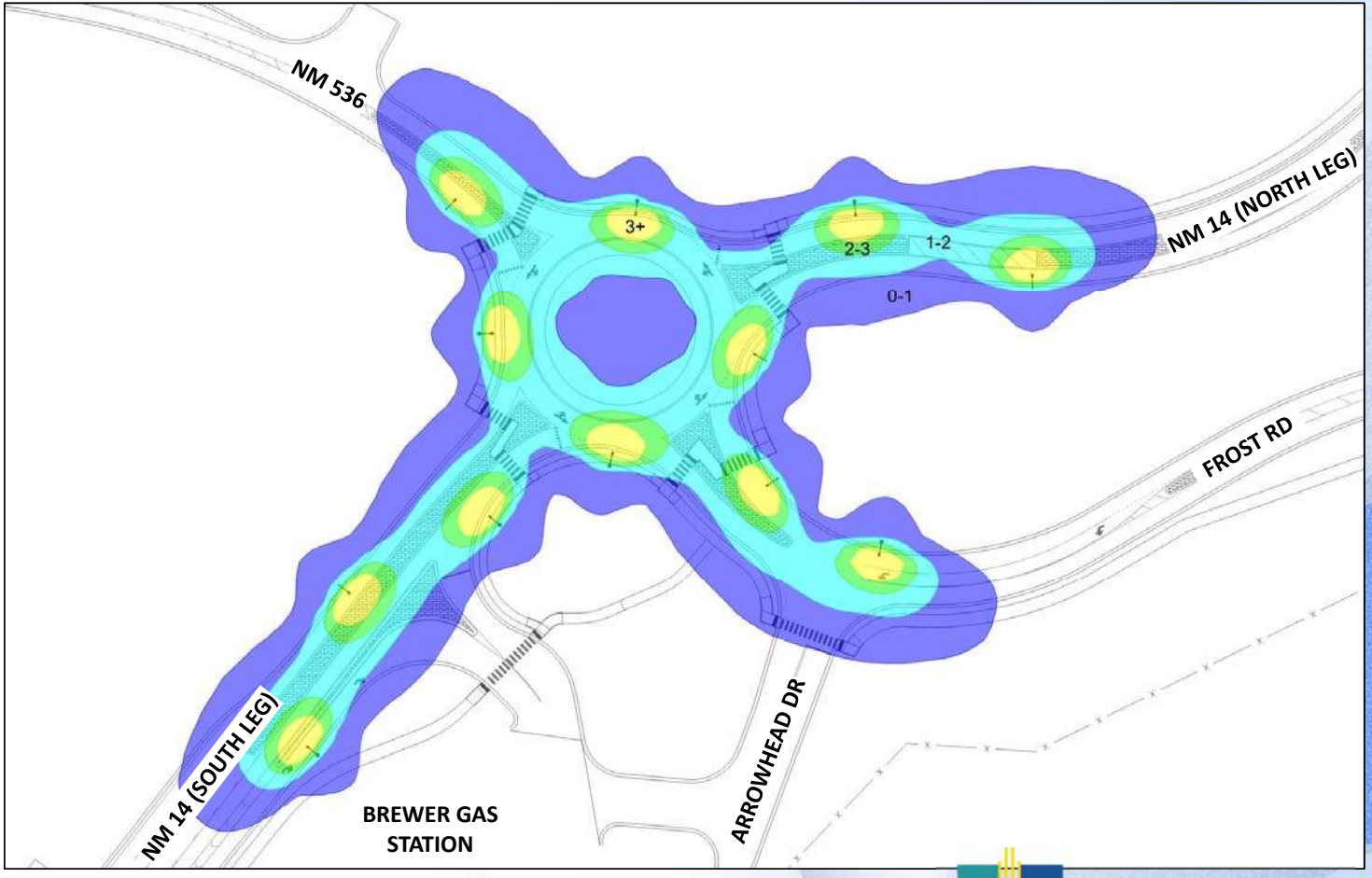
Lighting Analysis Visual

- White (0)
  - Untouched by street lighting
- Purple (0-1)
  - Little to no illumination
- Cyan (1-2)
  - Moderate illumination
- Green (2-3)
  - High illumination
- Yellow (3+)
  - Substantial illumination



Sustainable Stormwater Design

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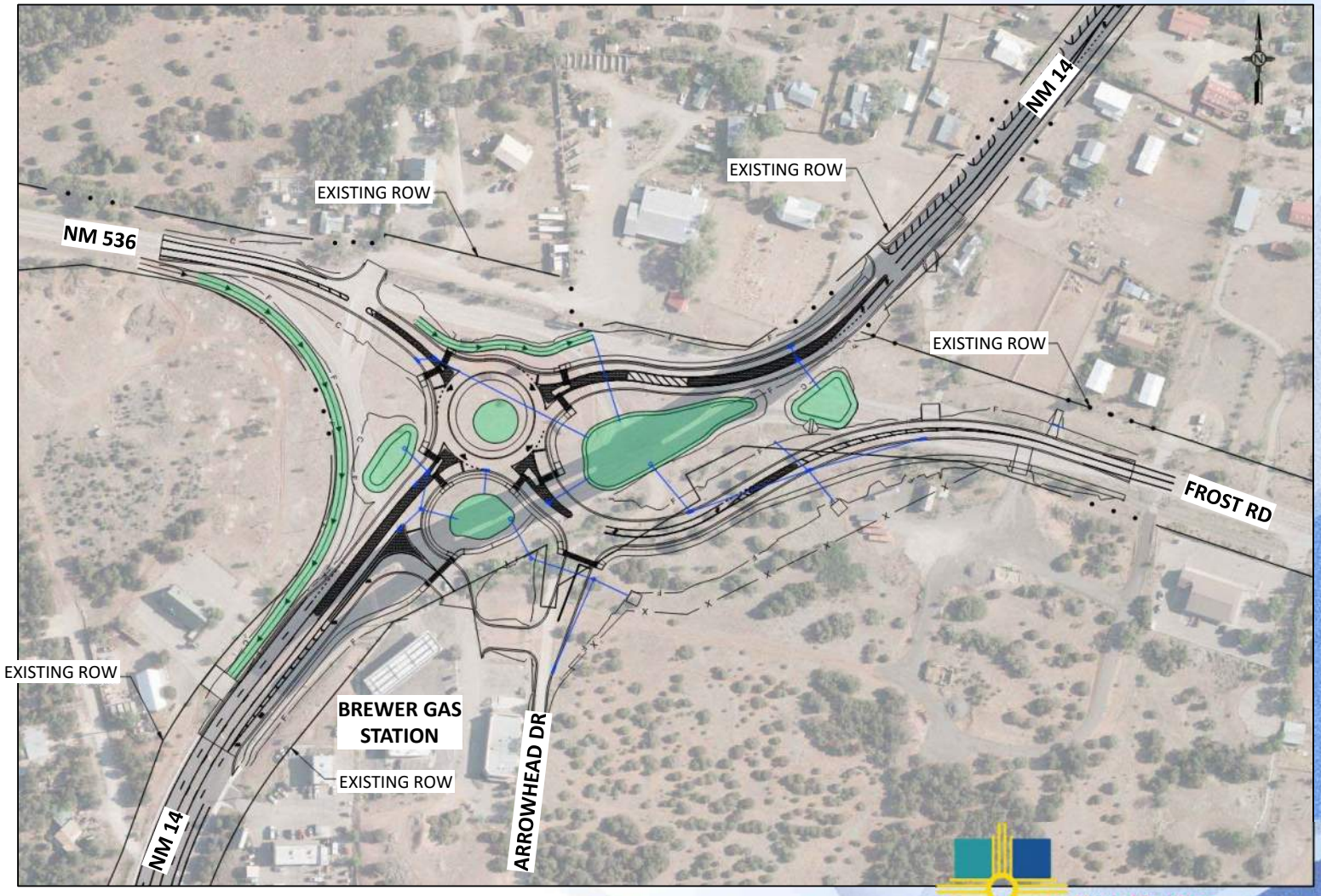
Proposed Conditions

- Existing storm drain infrastructure will be removed as it will no longer serve the proposed design
- New storm drain system will feed into Green Stormwater Infrastructure (GSI) ponds
- Bioswales will also be used to convey stormwater runoff
- GSI ponds will be landscaped and are designed to be self sufficient once established (i.e. no permanent irrigation system needed)
- Existing flows will be maintained beyond project limits



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Benefits of Green Stormwater Infrastructure

- Improves water quality and downstream riparian ecology
- Improves aesthetics without long-term potable water use
- Creates wildlife habitats
- Sequesters carbon
- Recharges groundwater (depends on site geology)
- Supports soils that can absorb water more quickly
- General climate resiliency and sustainability

Stormwater Harvesting Basin at CNM

MRWM

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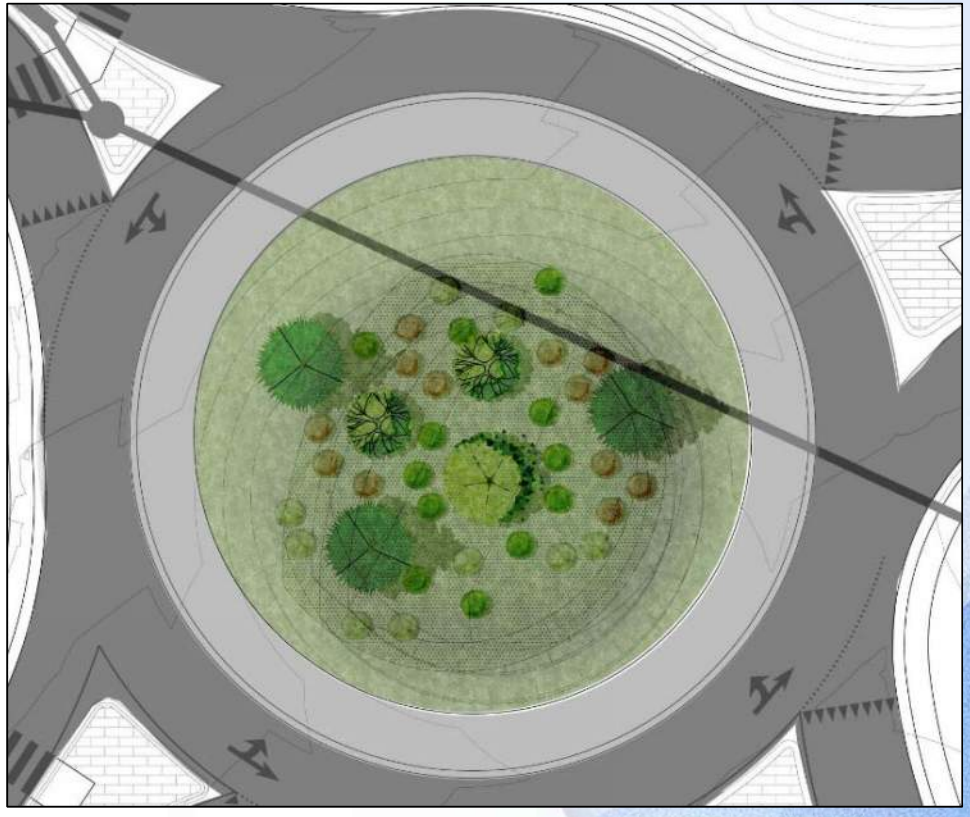
Planting Strategy

- Revegetation seeding throughout landscape area:
  - Grasses
  - Perennials

- Tree plantings (in ponding areas):
  - Rocky Mountain Juniper
  - One-Seed Juniper
  - Gambel Oak
  - Box Elder
  - Choke Cherry

- Shrub plantings (in ponding areas):
  - Three Leaf Sumac
  - Chamisa
  - Woods Rose
  - Coyote Willow



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Woods Rose

Choke Cherry

Three Leaf Sumac

Chamisa

Gambel Oak

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Bioswales

- Seeded with drought adapted grasses and perennials
- Improves water quality by conveying, slowing, and treating runoff
- Allows trash, debris, and other pollutants to be captured before reaching downstream watersheds
- Promotes healthier waterways and improves overall stormwater quality

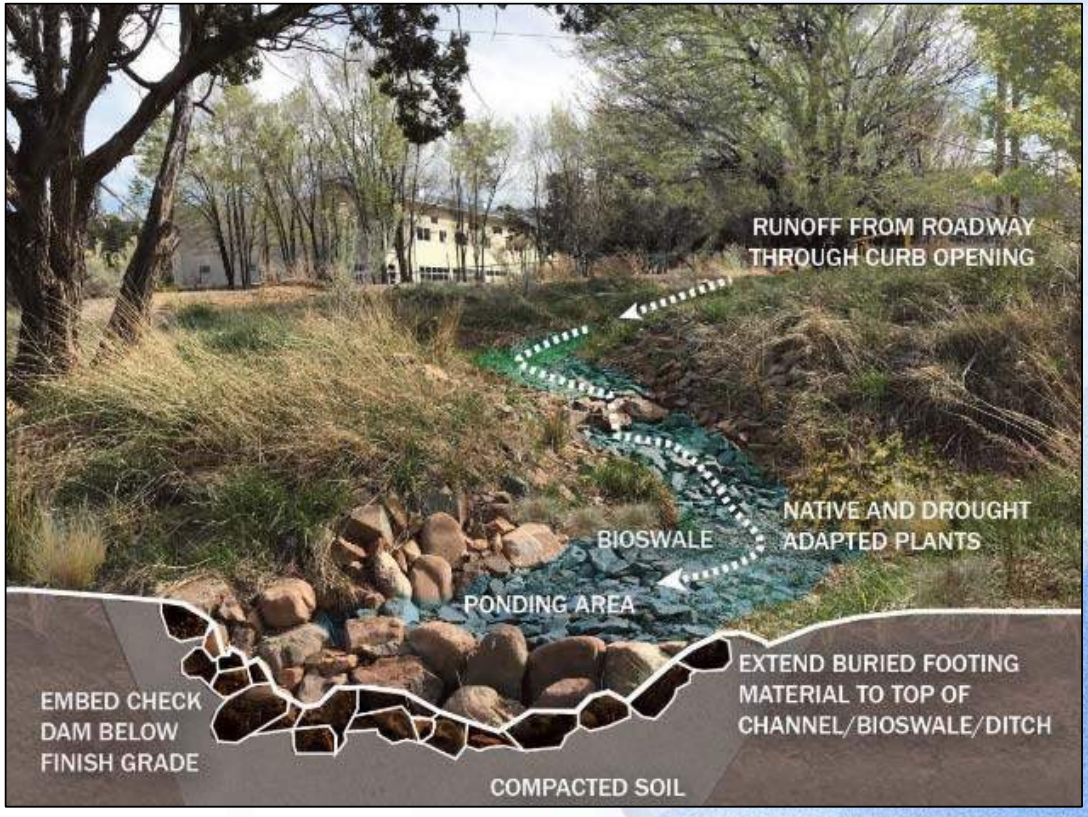

Diagram from Bernalillo County GIS/LID Technical Standards, Draft

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Existing Swale (NM 14/Frost Rd)

- Vegetated with native and drought adapted grasses and shrubs
- Visibly greener and more durable landscaping along flow path due to increased infiltration

Existing swale adjacent to NM 14/Frost Rd intersection

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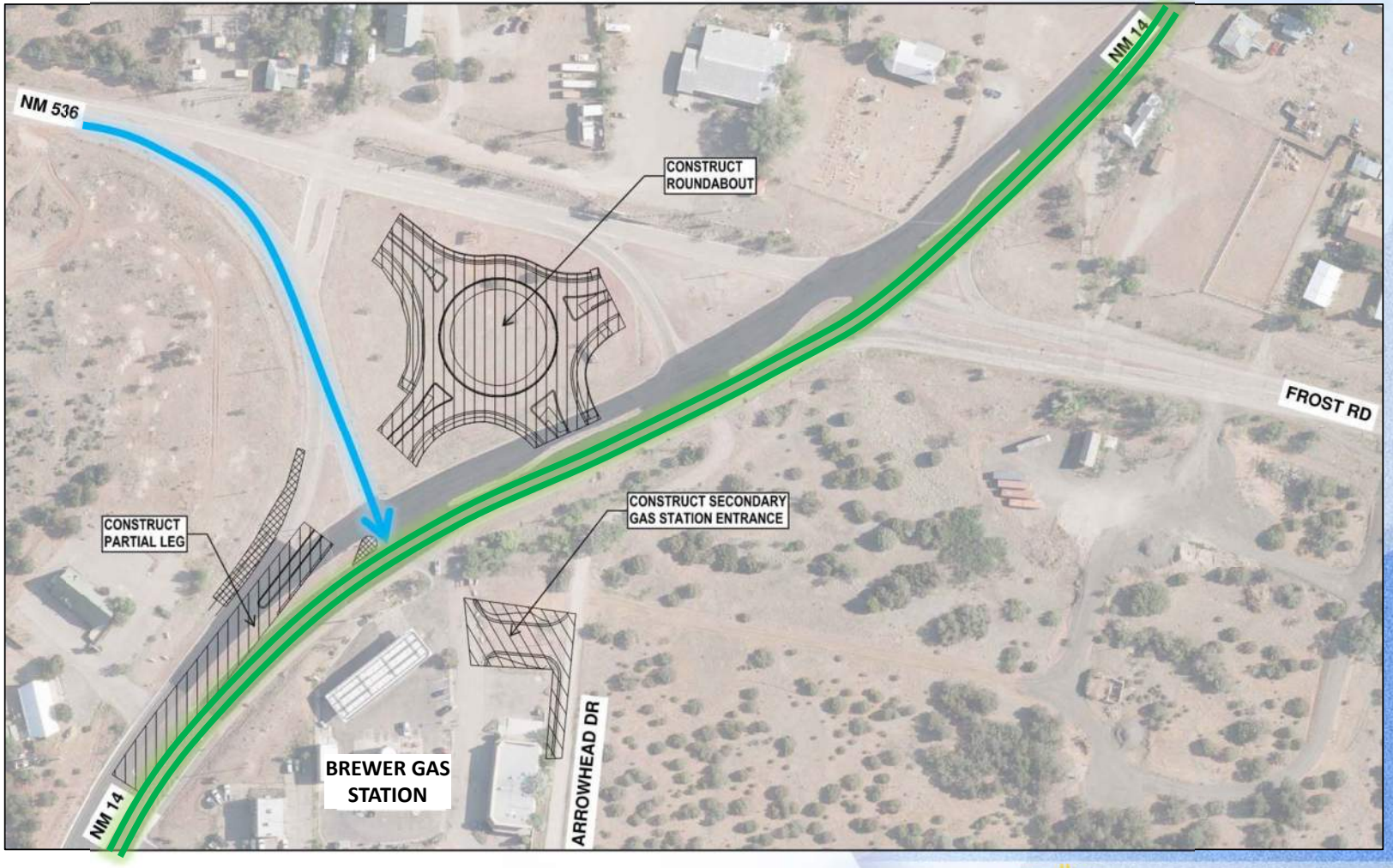
Temporary Traffic Control

Phase 1A

- NM 14: Two-Way traffic will be shifted to northbound lanes
- NM 536: Eastbound traffic will be restricted to a temporary T-intersection
- NM 536: Westbound traffic remains unchanged
- Frost Rd: Remains unchanged
- Pedestrian facilities remain unchanged



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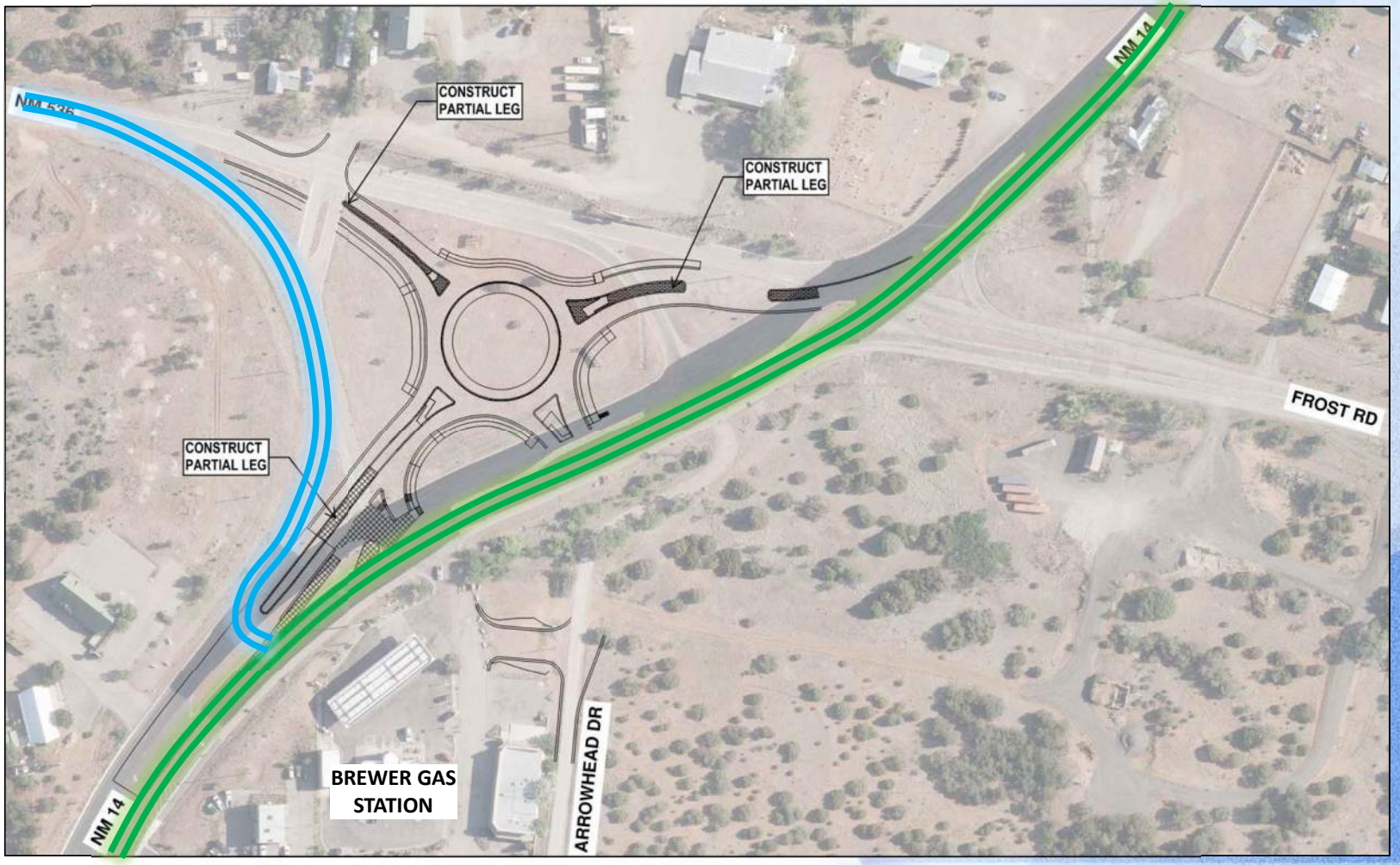
Phase 1B

- NM 14: Two-Way traffic will remain on northbound lanes
- NM 536: All traffic will be routed to a temporary T-intersection to the west
- Frost Rd: Remains unchanged
- Pedestrian facilities remain unchanged.



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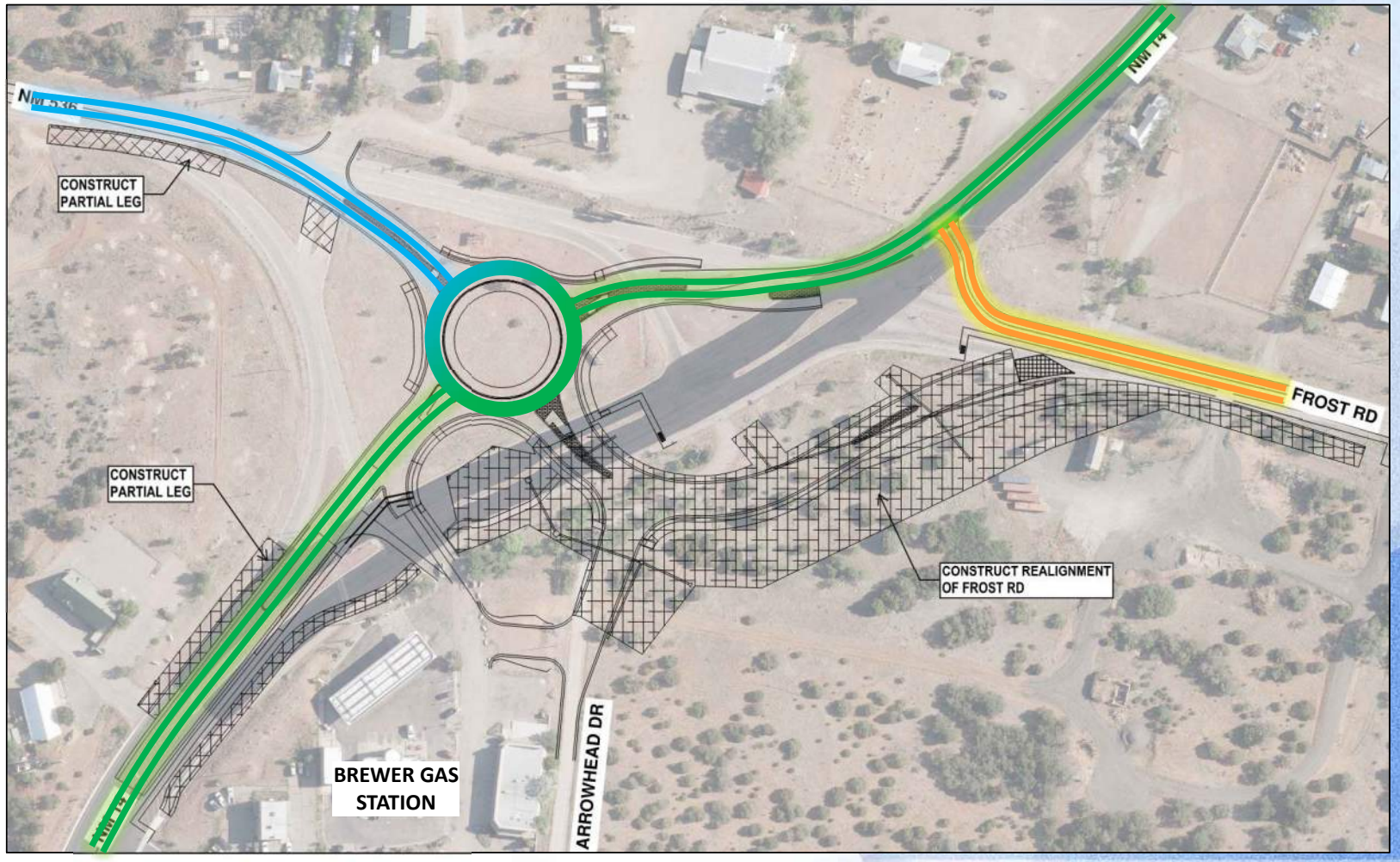
Phase 2

- NM 14: Two-Way traffic will be shifted onto roundabout
- NM 536: Two-Way traffic will be shifted onto roundabout
- Frost Rd: Traffic will be routed to a temporary T-intersection on NM 14
- Pedestrians will be routed around work zones.



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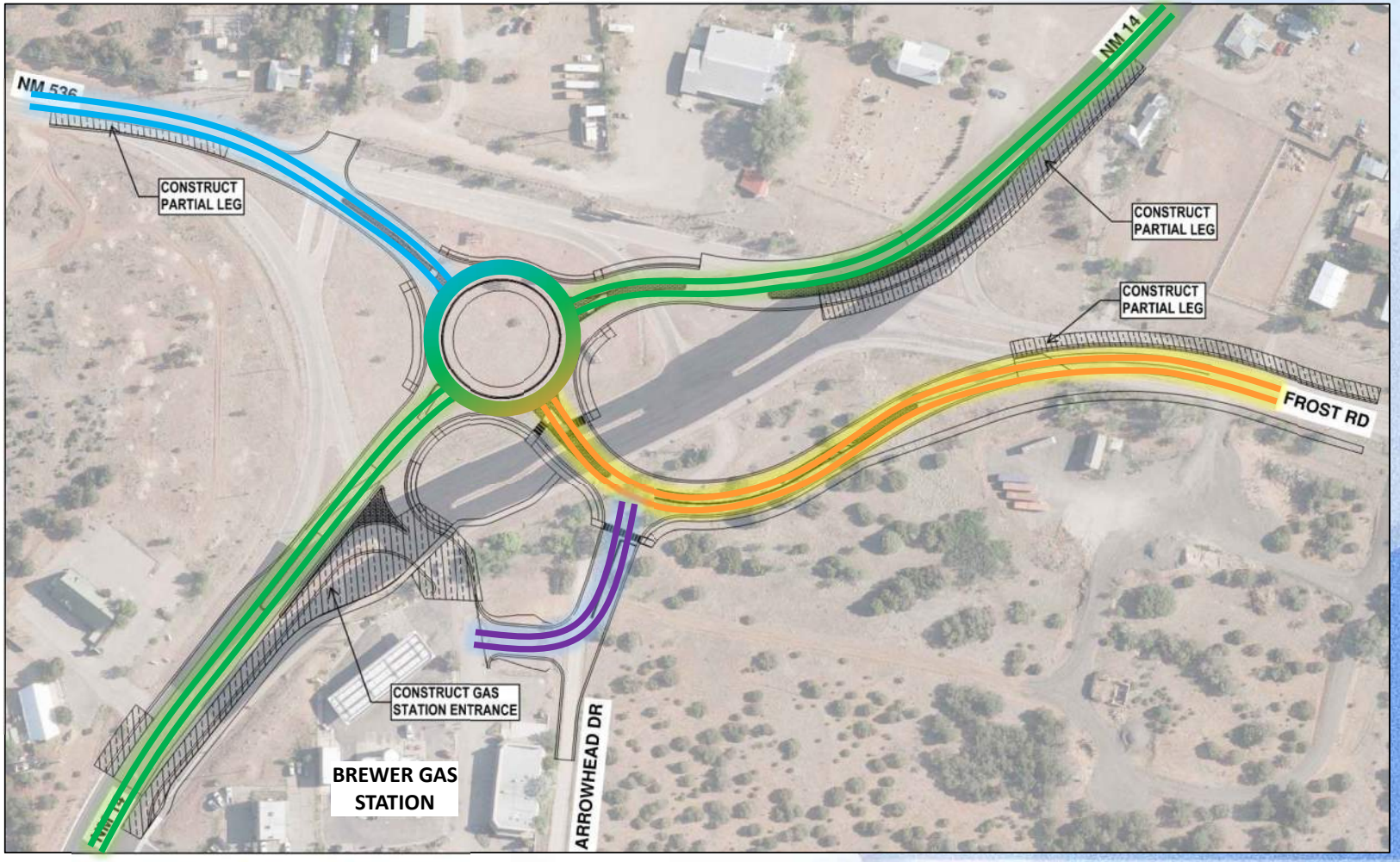
Phase 3

- NM 14: Two-Way traffic will continue to use roundabout
- NM 536: Two-Way traffic will continue to use roundabout
- Frost Rd: Traffic will be shifted onto roundabout
- Gas station access will be provided from Arrowhead Dr
- Pedestrians can now utilize permanent infrastructure



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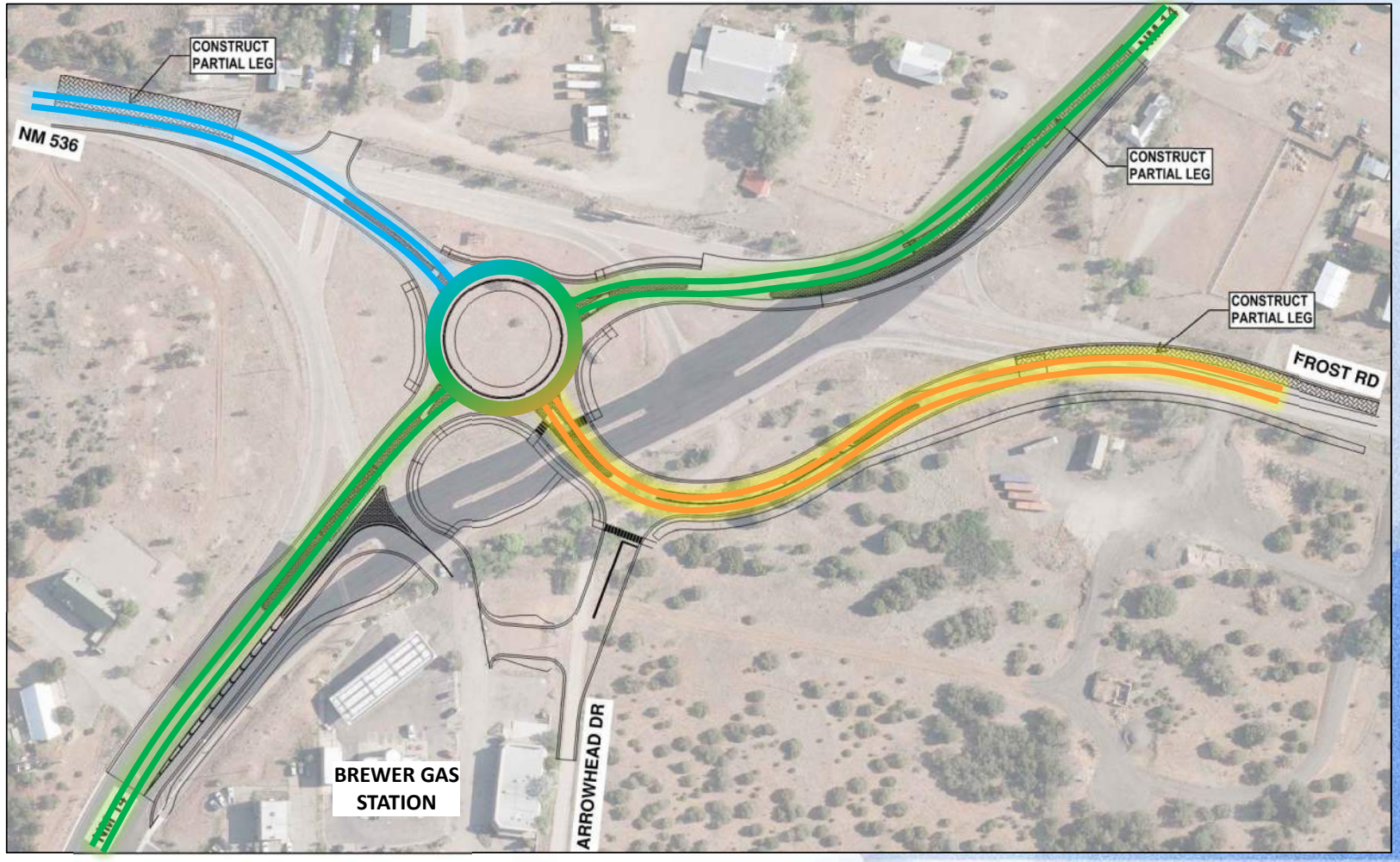
Phase 4

- NM 14: Southern leg is complete, Northern leg still under construction
- NM 536: Undergoes final phase of construction
- Frost Rd: East end is still under construction
- Full access to gas station
- Pedestrians can now utilize permanent infrastructure



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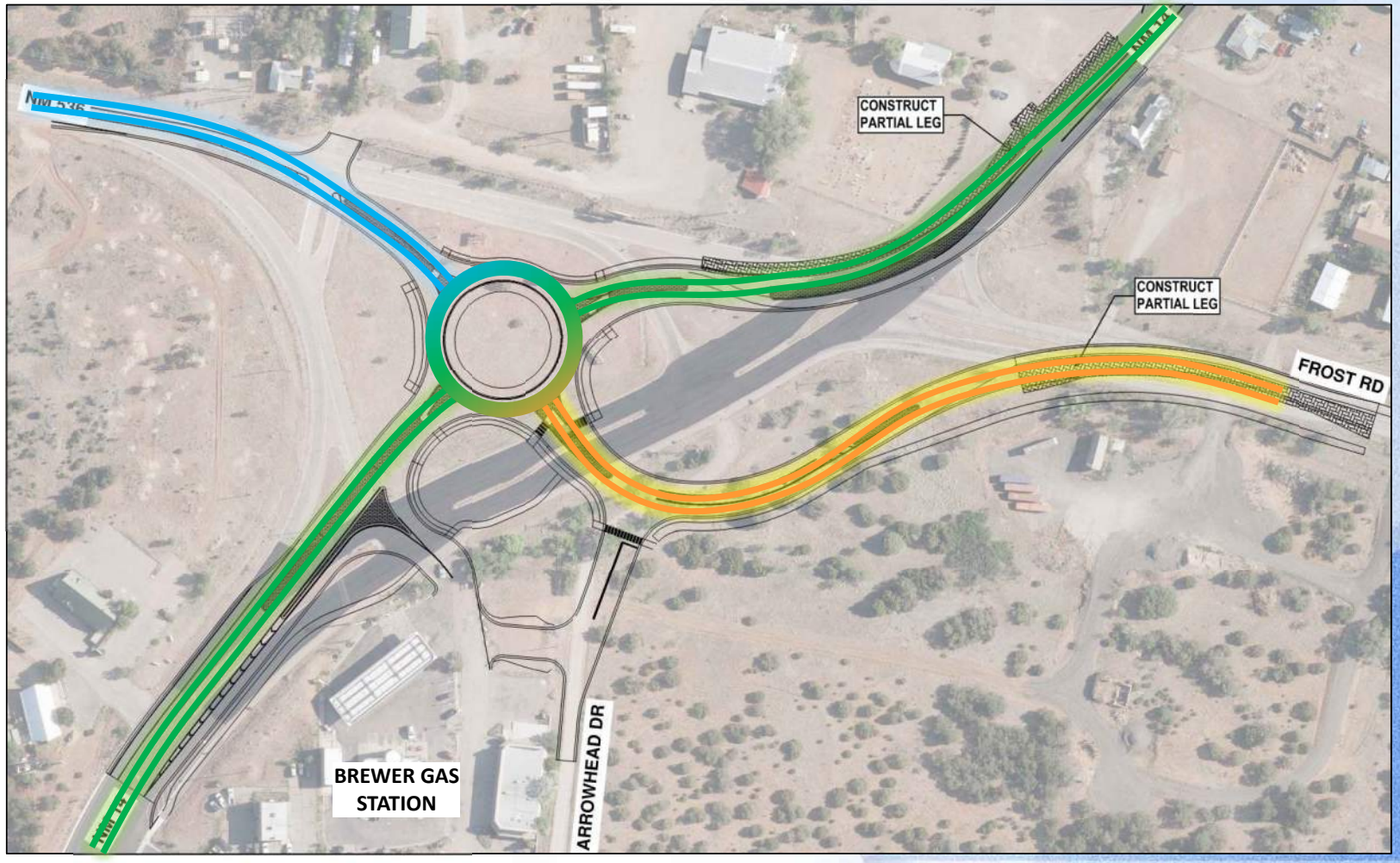
Phase 5

- NM 14: Southern leg is complete, Northern leg undergoes final phase of construction
- NM 536: Complete
- Frost Rd: East end undergoes final phase of construction
- Full access to gas station
- Multi-use Path in front of San Antonito Church being completed this phase



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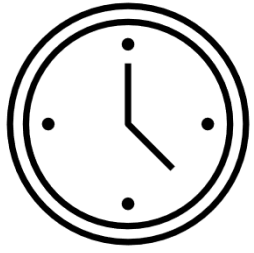
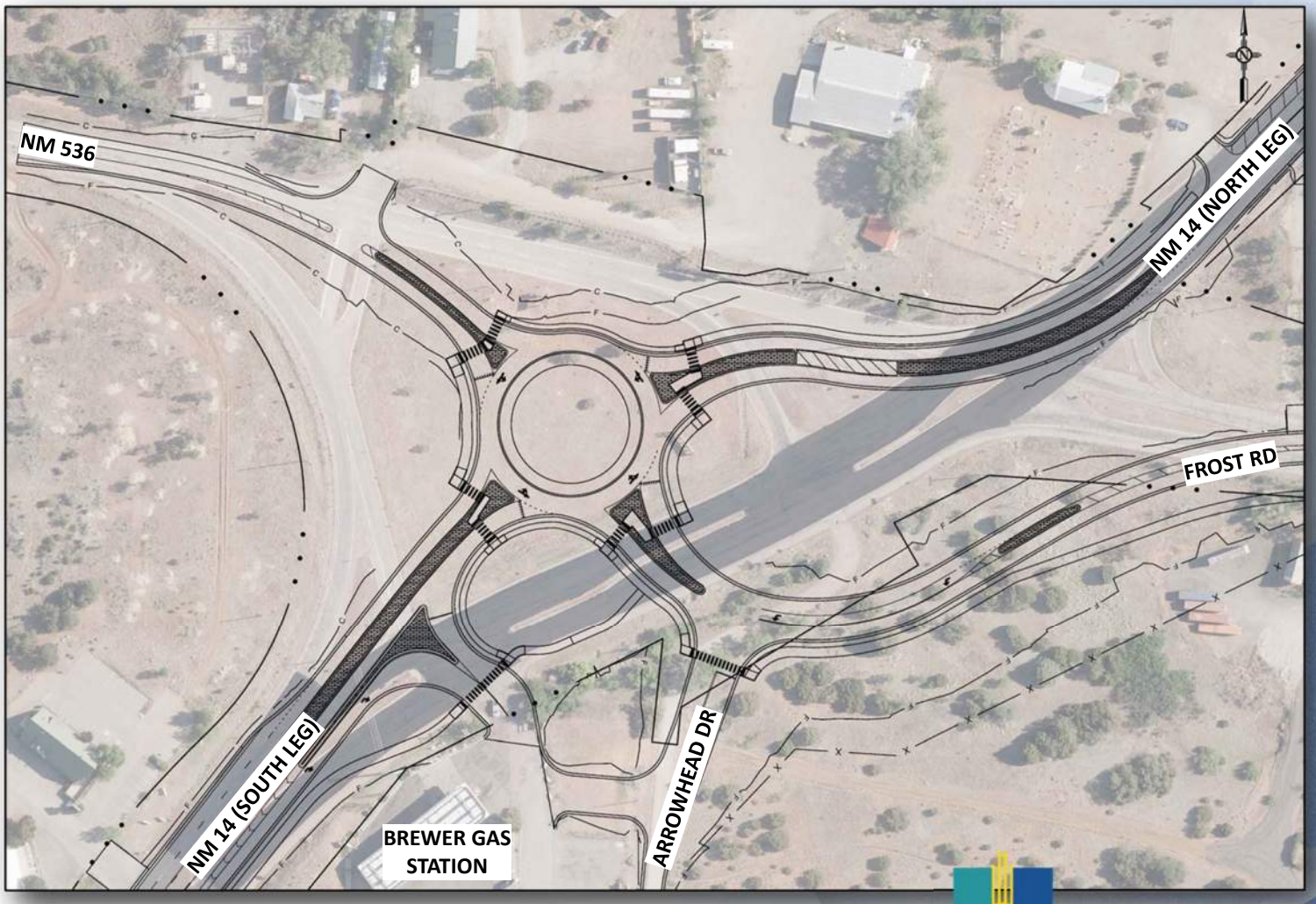
Construction Duration

- Overall construction is expected to last 12-18 months.
- On average, each phase of construction will last 10-15 weeks, plus time to transition between phases.





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Drive-Thru Simulation Video

https://youtu.be/89t5cz2PePs

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Next Steps

- Preliminary design is complete
- Final design expected to be complete by end of 2022
- Bidding expected Spring 2023
- Construction expected Fall 2023

Questions?

Comment Period Ends April 8th, 2022

During this Meeting

- Raise a hand (go to “Reactions” and click “Raise hand”) – we will ask you to unmute yourself when it’s your turn. Please limit your comments to 2 minutes.
- Type your comments in the Zoom Chat Box
- Call or Text your comments to (505) 980-6065

After this meeting

- Email us: devin@pathfinderenvironmental.com
- Call us: (505) 699-5175
- Mail us:

NM 14/NM 536/Frost Road Project
Pathfinder Environmental LLC
Attn: Devin Kennemore
1800 Old Pecos Trail, Ste E, #5
Santa Fe, NM 87505

A RECORDING OF THIS PUBLIC INFORMATION MEETING WILL BE MADE AVAILABLE ON THE PROJECT WEBSITE:

https://nm14sanantonito.nmdotprojects.org/

Bohannan Huston

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