Trident Data Center at Windler: 2-Page Briefing Paper

Campus Scale, Power, Cooling Plants, and Backup Diesel Generator Fleet

- Two 62-ft-tall data center buildings (twice the footprint of the Aurora Municipal Center, half the height) on 108 acres (82 football fields) at E. 48th Avenue and E-470.
- Immediately adjacent to a 55+ senior community and residential neighborhoods developed by Windler Homes, and Oakwood Homes.
- At full buildout (~500 MW gross utility demand), the facility consumes nearly four times as much electricity as Denver International Airport or 150,000 homes.
- The nearest operational 500 MW data center is the Google Cloud flagship, 530 miles from Aurora, with wind and nuclear power (planned), 3 miles from residential areas.

24/7 Outdoor Air-Cooled Chiller Plants: Trident cannot use evaporative water-cooling towers because of the water restrictions in its 2022 rezoning to an industrial warehouse park (AD). Instead, the Site Plan relies on 20 closed-loop glycol chiller plants paired with 112 dry-cooler bays and 336 axial cooling fans (14-ft diameter), running 24 hours a day, 365 days a year. These arrays are the primary source of continuous low-frequency noise (LFN).

80 Locomotive-Sized Backup Diesel Generators: Trident's Site Plan (Sheet 90) depicts 80 backup diesel generator pads, or 209 generators in Trident documents for air quality (CDPHE) and acoustic studies. Each generator is comparable to a freight-train locomotive, discharging unabated exhaust through dual stacks (31 to 39 ft above grade), well below the 154 ft suggested by EPA to escape aerodynamic downwash. There are no EPA Tier 4 diesel engines, no Selective Catalytic Reduction equipment, and no Diesel Particulate Filters.

Affected Residents and Six Schools Across Three Adverse Impact Zones

Zone 1 — Immediate Impact Zone (0 to 1.0 Mile):

- ~5,400 current residents (~8,200 at buildout); ~1,400 current children (~2,100 at buildout); ~4,000 current adults (~6,100 at buildout)
- Pitt Waller K-8 (0.70 mi) and Aurora Highlands P-8 (0.90 mi)
- Foreseeable adverse impacts:
  - Window rattle (0.71 mi)
  - Throbbing hum and classroom speech interference (0.76 mi)
  - Indoor pillow sleep disruption (nighttime LFN exceeding the safe indoor sleep limit, fragmenting deep slow-wave sleep)
  - Bedroom corner standing-wave sleep disruption (low-frequency waves bounce between room walls, building up where beds and cribs are placed)
  - Diesel exhaust building downwash

Zone 2 — Secondary Impact Zone (1.0 to 2.0 Miles):

- Additional ~15,000 residents (~22,000 at buildout); ~5,700 children at buildout.
- Green Valley Elementary (1.6 mi), Sandra Todd-Williams Academy (1.7 mi), and Omar D. Blair Charter School (1.7 mi)
- High-pitched sound fades while unattenuated bass creates a throbbing hum, standing-wave sleep disruption, and indoor pillow sleep disruption (1.8 mi).

Zone 3 — Extended Impact Area (2.0 to 3.0 Miles):

- Additional ~20,000 residents (~25,000 at buildout); ~6,500 children at buildout.
- Temperature inversions trap diesel plumes near the ground and bend bass waves downward, pushing bedroom corner standing-wave sleep disruption to 3.0 miles (3.8 miles during generator outages).

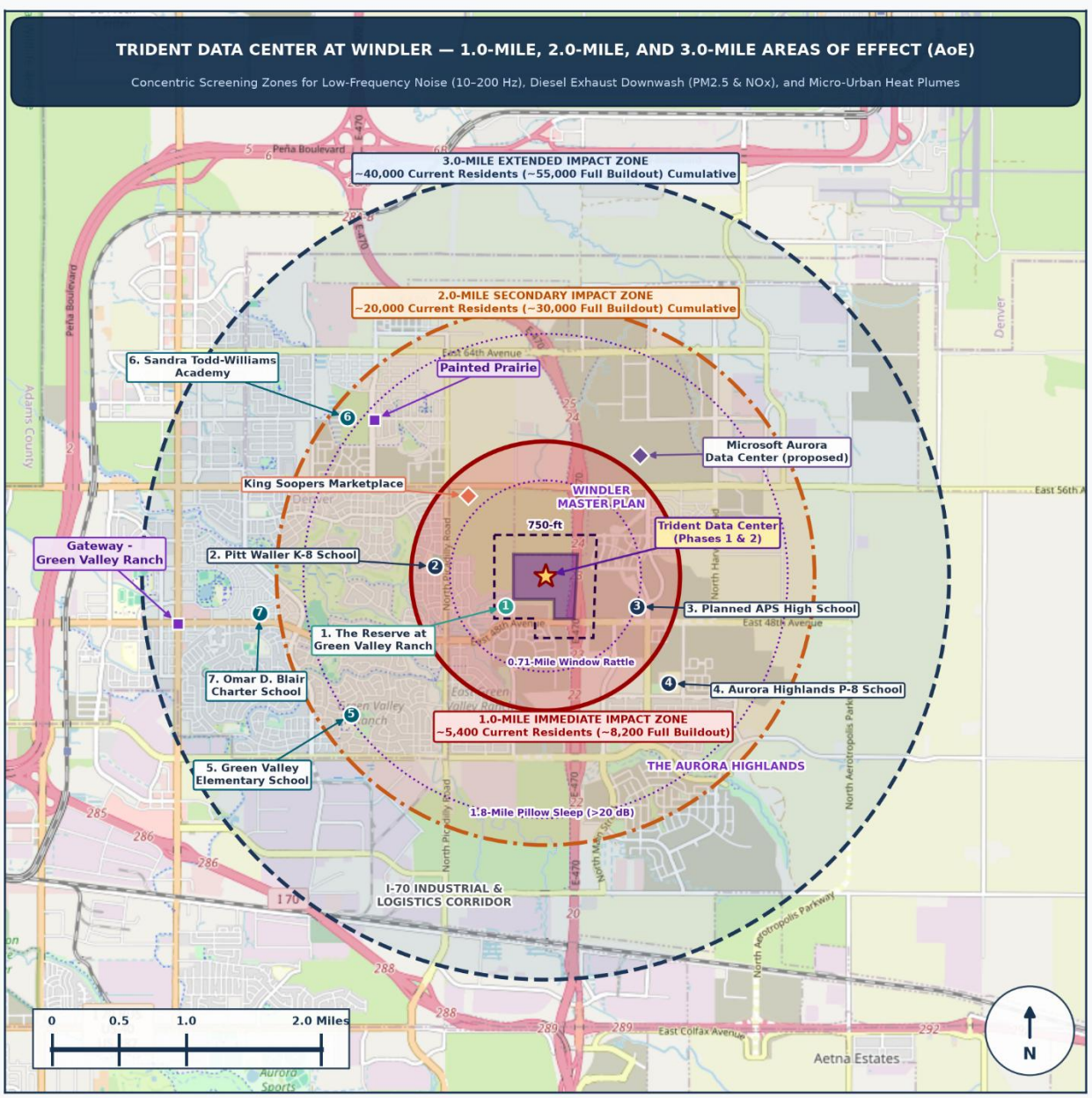
Who Is Most Vulnerable to Health Impacts?

Children & Unborn Babies (~1,400 / ~2,100 buildout within 1 mile; ~10,000 / ~14,000 buildout within 3 miles)**:** Children breathe more air per pound of body weight than adults, making their growing lungs highly vulnerable to diesel soot and ozone smog, with long-term exposure linked to reduced lung growth and asthma exacerbations (*Gauderman et al., 2004; Jerrett et al., 2009; WHO, 2021*). Peer-reviewed studies also link low-frequency noise to spikes in nighttime stress hormones (cortisol), disrupted deep sleep, and harder classroom listening and reading (*Ising & Ising, 2002; Stansfeld et al., 2005*).

Older Adults (Age 55+): Long-term exposure to $PM_{2.5}$ and warm-season ozone increases cardiovascular and respiratory mortality in older adults (*Di et al., 2017; Bell et al., 2005*). Older adults also lose high-pitched hearing first while keeping their ability to hear low-pitched bass. Because high-pitched background sounds no longer mask the bass hum, seniors often hear an isolated, booming indoor drone at night that fragments deep sleep and increases cardiovascular stress (*Berglund et al., 1996; Cantuaria et al., 2021*).

Veterans & Survivors of Brain Injury (TBI) or PTSD: Brain injuries and trauma can damage the brain's natural filter that blocks out repetitive background droning, causing painful sensitivity to sound and inner-ear vibration, leading to dizziness, migraines, anxiety, and severe insomnia (*Fagelson, 2007; Holstein et al., 2010; Theodoroff et al., 2019*).

Autistic Individuals (ASD) & Other LFN-Sensitive Health Conditions (~40 autistic children & ~90 autistic adults within 1 mile; ~300 autistic children & ~650 autistic adults within 3 miles)**:** Between 50% and 70% of autistic individuals experience painful or overwhelming sound sensitivity and lack the brain's automatic ability to tune out constant low-frequency hums and chest/inner-ear vibrations—leading to fight-or-flight stress, mental exhaustion, anxiety, and sensory meltdowns (*CDC, 2024; Williams et al., 2021*). People with Ménière's disease, inner-ear vestibular disorders, chronic migraines, tinnitus, or fibromyalgia can also suffer severe vertigo, nausea, headaches, and sleep loss from low-frequency pressure waves (*Salt & Hullar, 2010; Furman et al., 2013*).



1. CONCENTRIC AREAS OF EFFECT (AoE) LEGEND

- Trident Data Center Campus Boundary (r0 = 0.22 mi) 108 Acres (CO21 & CO22, 80 Gen Pads, 20 Chiller Plants)
- 750-ft Boundary from Trident Data Center (Phases 1 & 2) Fine dashed polygon 750 ft outward from campus line
- 1.0-Mile Immediate Impact Zone (0 to 1.0 mi) Near-field LFN & infrasound, vibration, window rattle, diesel exhaust building downwash, thermal plume.
- 2.0-Mile Secondary Impact Zone (1.0 to 2.0 mi Ring) Mid-field LFN & infrasound, structural resonance, tonal hum, building downwash traps diesel exhaust pollution.
- 3.0-Mile Extended Impact Area (2.0 to 3.0 mi Ring) Cumulative exposure of sensitive populations to LFN, dispersed fine particulate matter, and ozone.

Base Map: © OpenStreetMap Contributors | November 2026

2. ADJACENT PROPERTY OWNERS / AGGRIEVED PERSONS

Impact Zone / Criterion	Radius	Current	Buildout
Campus Boundary (r0)	0.22 mi	0	0
Cat. I: Whole-Body Vibration	0.37 mi	~530	(~800)
Cat. I: Window Rattle	0.71 mi	~2,700	(~4,100)
Cat. III: Classroom LFN	0.76 mi	~3,200	(~4,800)
1-Mile Immediate AoE	**1.0 mi**	**~5,400**	**(~8,200)**
Cat. II: Daytime >60 dBC	1.5 mi	~12,000	(~17,000)
Cat. IV: Pillow Sleep (>20 dB)	1.8 mi	~16,000	(~24,000)
1-to-2-Mile Ring Only	**1.0–2.0 mi**	**~15,000**	**(~22,000)**
2-Mile Cumulative AoE	**2.0 mi**	**~20,000**	**(~30,000)**
Cat. II: Nighttime >55 dBC	2.4 mi	~27,000	(~39,000)
2-to-3-Mile Ring Only	**2.0–3.0 mi**	**~20,000**	**(~25,000)**
3-Mile Cumulative AoE	**3.0 mi**	**~40,000**	**(~55,000)**

3. FEATURED PROTECTED LOTS IN SURROUNDING AREA

Neighboring Land Zones & Noise-Sensitive Receptors:

1. The Reserve at Green Valley Ranch:	Adjacent West
2. Pitt Waller K-8 School (DPS):	0.8 miles West
3. Planned APS High School:	0.7 miles East
4. Aurora Highlands P-8 School (APS):	1.2 miles SE
5. Green Valley Elementary School (DPS):	1.8 miles SW
6. Sandra Todd-Williams Academy (APS):	1.9 miles NW
7. Omar D. Blair Charter School (DPS):	2.1 miles West