Calhoun Isles Condominium Association (CICA)
Proposed Susceptibility Study Legislation

Legislative Commission
on Metropolitan Governance
Hearing at the State Capitol

January 24, 2018

Calhoun Isles Condominium Association Presenters

• Introduction:	Nick Shuraleff Board President
• Background:	Chris Hayhoe Attorney, Felhaber/Larson
• Urgency:	Paul Petzschke Committee Chair
• Technical Analysis:	Lee Petersen Itasca Principal Engineer

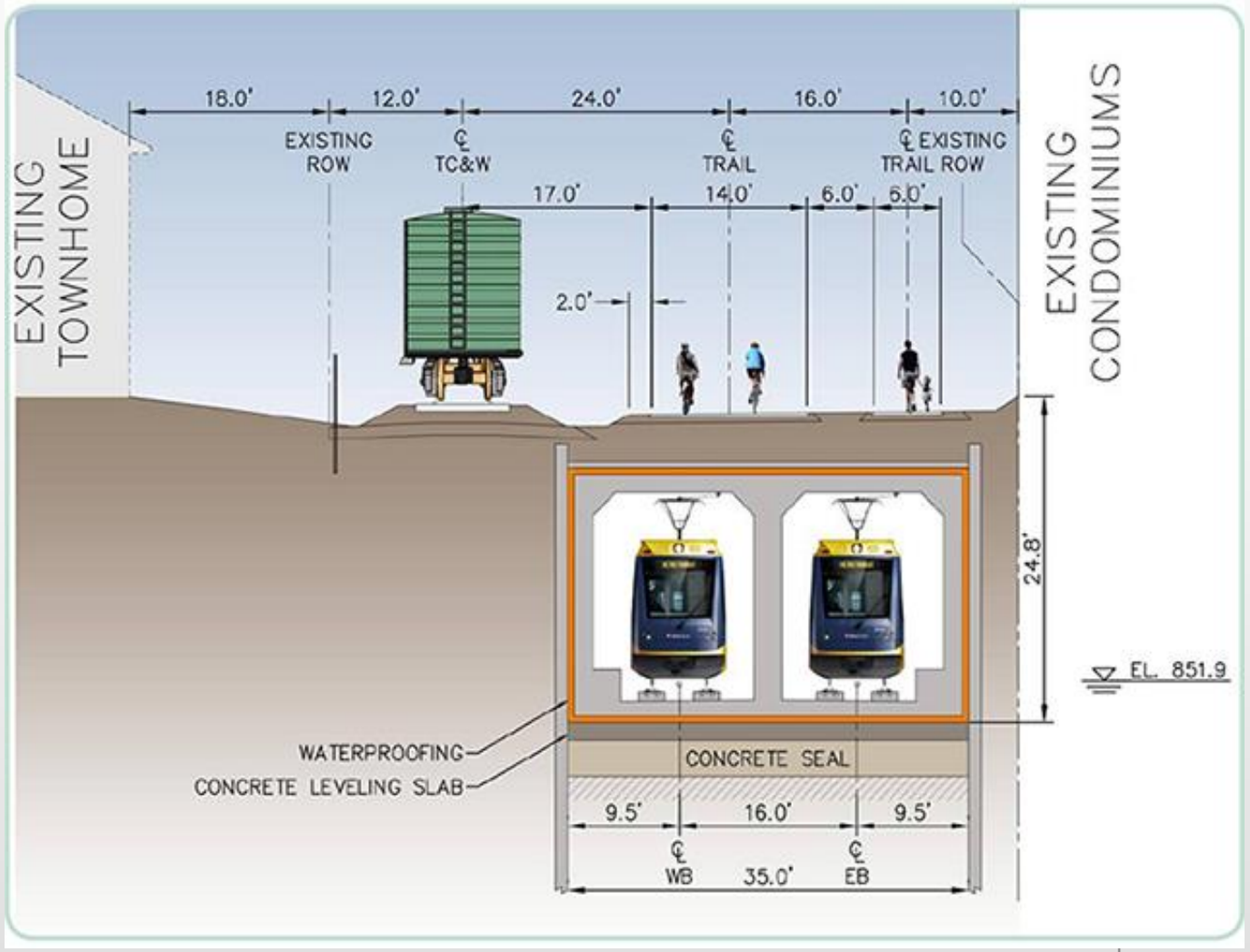
Calhoun Isles Condo Association

- 3 structures: high-rise (HR) , townhomes (TH), parking garage
- 143 units, 200 residents
- High-rise is a converted grain silo. The geometry, foundation, and 100 year old concrete make it a uniquely sensitive structure to vibrations.
- Calhoun Isles residents have mixed opinions on the SWLRT. The Board has taken a “neutral” position on the project.
- Our goal is to protect our property, safety and the living conditions during construction and operation of the SWLRT
- Have spent over $100,000 to date

SWLRT Proximity to Calhoun Isles

SWLRT Project Design Adjacent to CICA

- CICA High-Rise is located at the narrowest point on the SWLRT route aka the “pinch-point”
- To accommodate the passage of 2 LRT tracks and 1 freight track through this narrow right-of-way, LRT would be in shallow tunnel, with freight track and bike path at grade
- Construction would be within 2 feet of high-rise silo footings, 6 inches of garage footings, and 45 feet of townhomes
- The construction and operations of SWLRT will put our property and livability of our residents at risk.



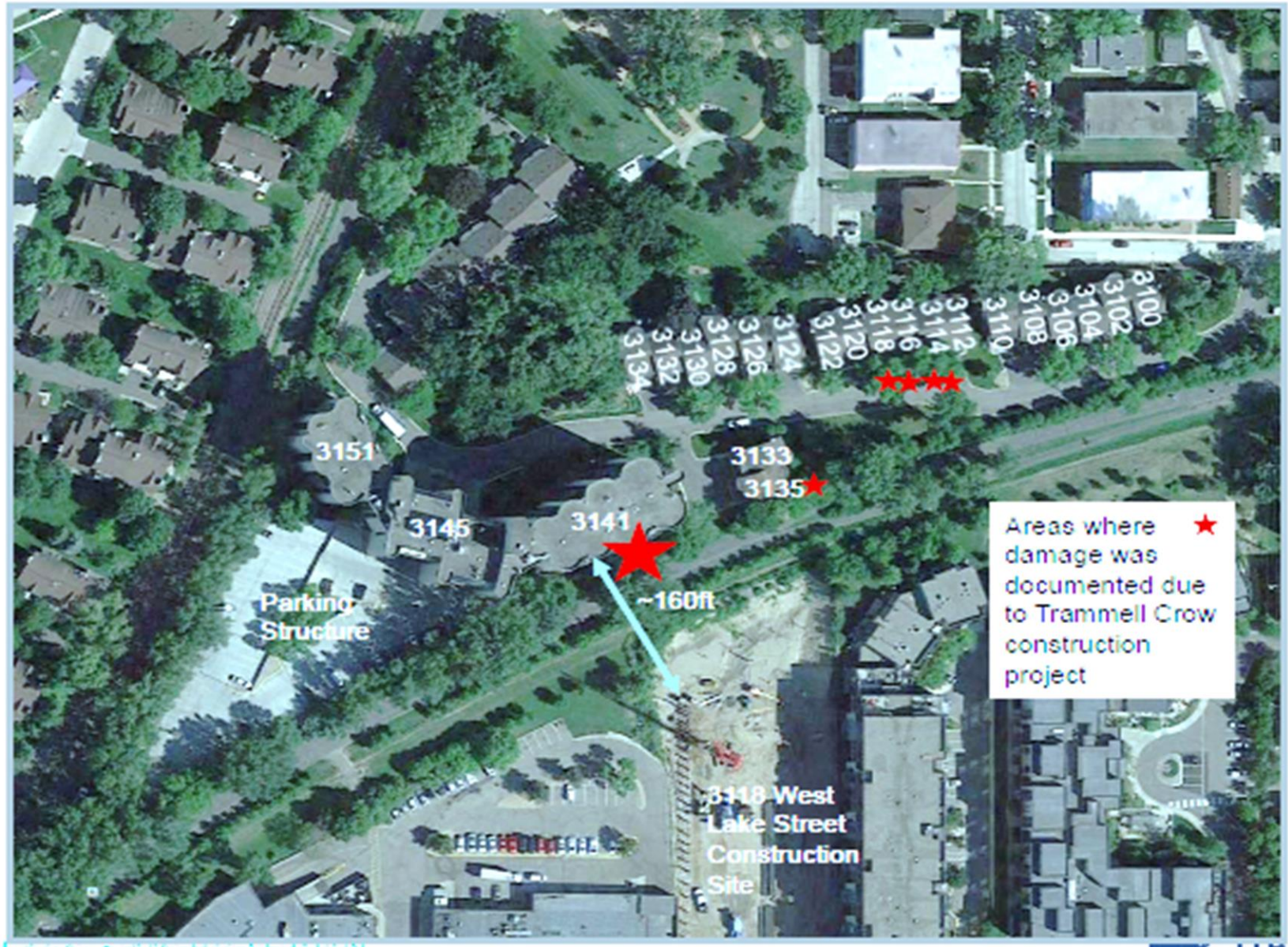
URGENCY

- We have tried to pursue cooperative solution with Met Council. We believed that Science would carry the Day but are we at loggerheads.
- There are less than 8 months to act given that construction is expected to start in the second half of 2018.
- Met Council's design plans specify a vibration level that is **three times** greater than the maximum vibration levels experienced during 2015 Trammel Crow project**.**
- Damages incurred on Day 1 from SWLRT project may not get settled until Day after 1000. The Met Council's damage resolution process and our insurance will only cover damages that are immediate or accidental.
- Damage not apparent will be difficult to resolve. High Rise is a unique structure. Damage to water pipes, stucco exterior, balconies, windows, and doors may not become apparent for months later. Project may accelerate fundamental problems and make ongoing maintenance costs prohibitive.
- The susceptibility study amendment, which passed both the House and Senate unanimously in 2017, was vetoed by Governor Dayton via a "line item veto".
- We are greatly concerned that operational vibrations from the 200 SW light rail trains running past our Association on a daily basis will be above FTA guidelines.

Damage experienced by CICA during Trammel Crow Construction

- The High Rise is 160 feet and the townhomes are 350 feet away from construction site
- Vibrations from Trammel Crow construction were not expected to cause any damage at our Association
- No Pre-construction surveys were done prior to construction
- However, $30,000 worth of damage occurred at Calhoun Isles properties. Both High Rise and Townhomes were affected
- Damage to the High Rise went up to the 8th floor
- Residents have stated that two were driven from homes; shelving knocked off walls; vibrations felt in elevators; unnerving sensations experienced on 11th floor

What damage occurred?



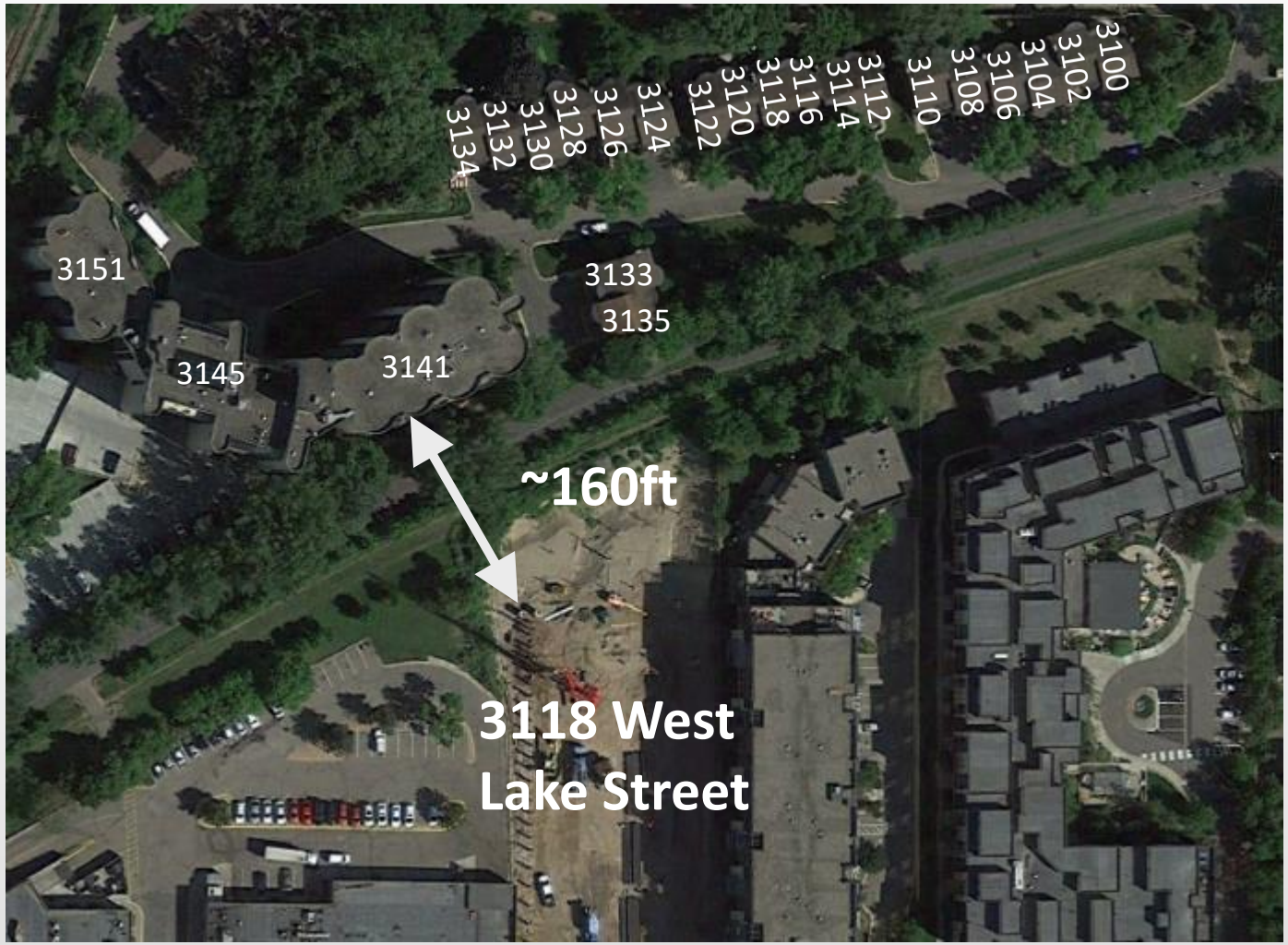
Trammel Crow Project: Impact on Calhoun Isles

Itasca's Assessment

- 2015 Trammel Crow Project Near CICA
- Prediction of SWLRT Operational Impacts

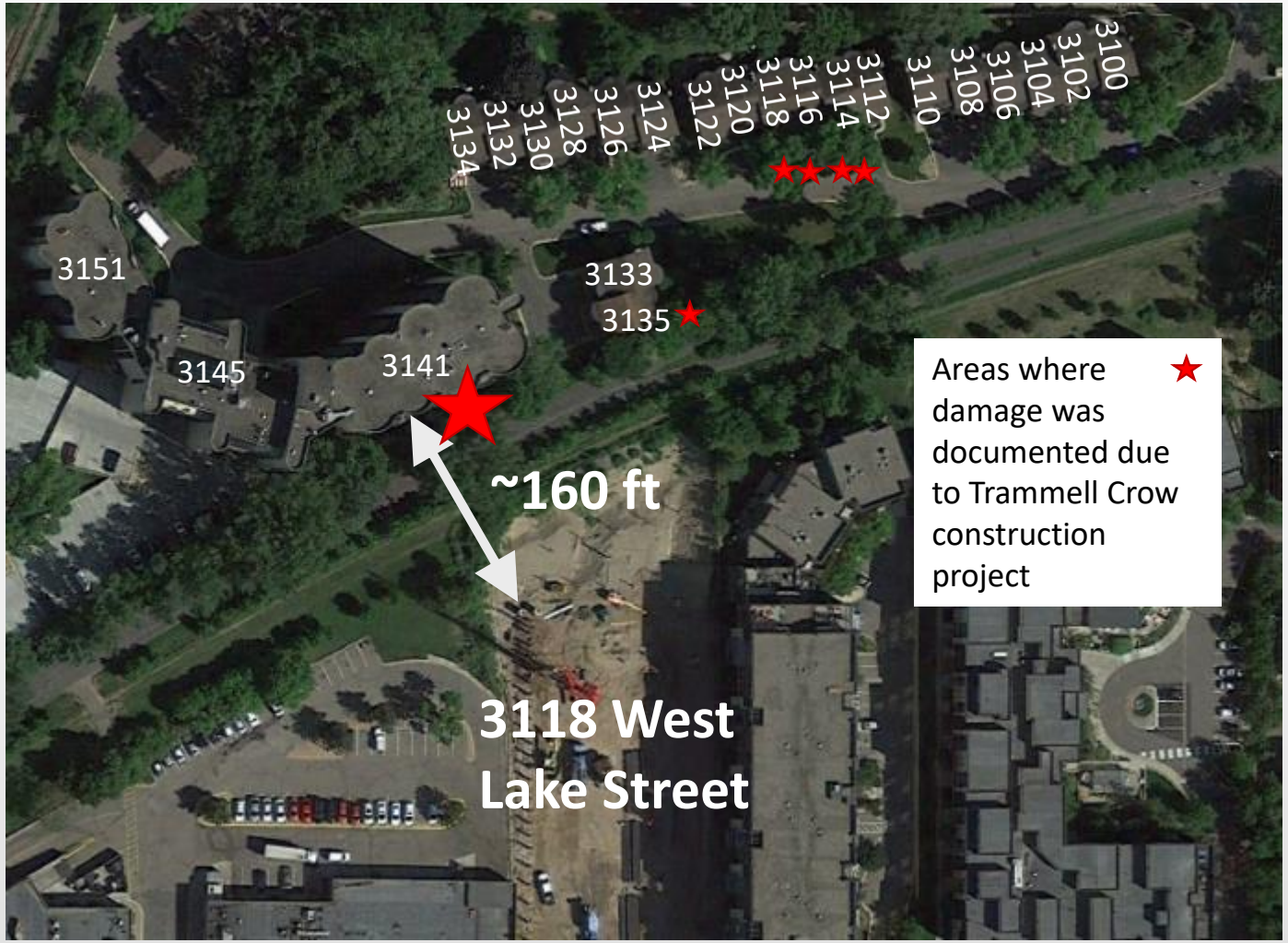
Trammel Crow Project Analysis--Expectations

- 2015 Project Near CICA
- What would be the expected impact on CICA?
- Some facts:
  - Pile driving 160 ft away
  - Estimated vibrations 0.2 ips
- At 0.2 ips, probability of threshold damage is ~1 percent
- Minor damage probability much much less



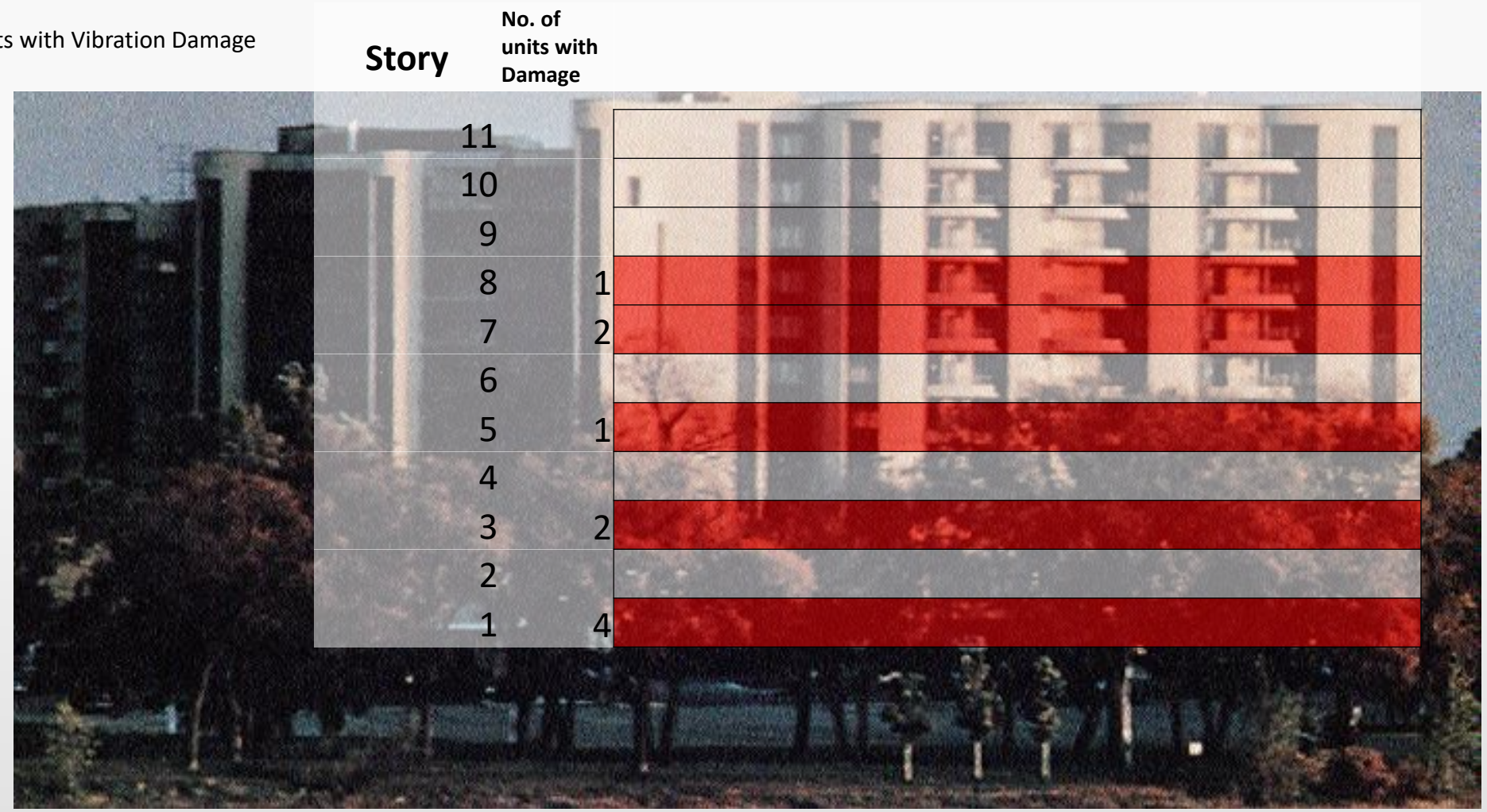
Trammel Crow Project—Actual Experience

- Measured vibrations 0.185 ips
- Slightly less than prediction
- Actual damage $30,000



Damage Schematic at 3141 Dean Court

- Units with Vibration Damage



Note: This diagram is meant to represent the vertical extent of reported damage. Indicated horizontal position of units is not the true location

Trammel Crow Project Analysis—Conclusion

- Vibration transmission through soil from pile driving location to high rise was as expected
- Expected damage very, very unlikely, yet:
- Significant damage occurred

- **High rise is especially susceptible to vibration transmission and damage**

Trammel Crow Project Analysis—Conclusion

Table 12-3. Construction Vibration Damage Criteria[11]

Building Category	PPV (in/sec)	Approximate L_v[†]
I. Reinforced-concrete, steel or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

[†] RMS velocity in decibels (VdB) re 1 micro-inch/second

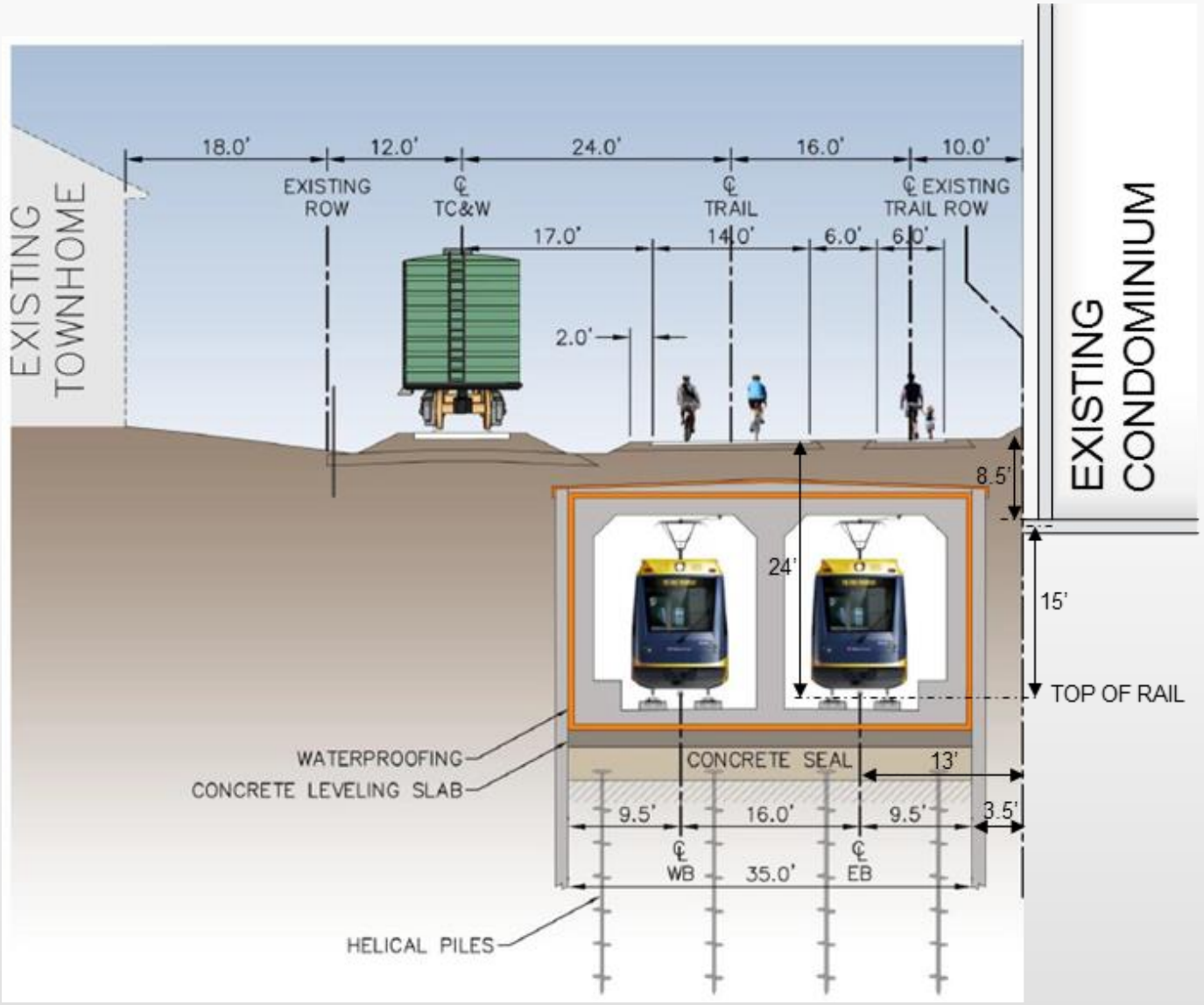
MC Proposed criterion = 0.5 ips

TC project measured vibrations = 0.185 ips

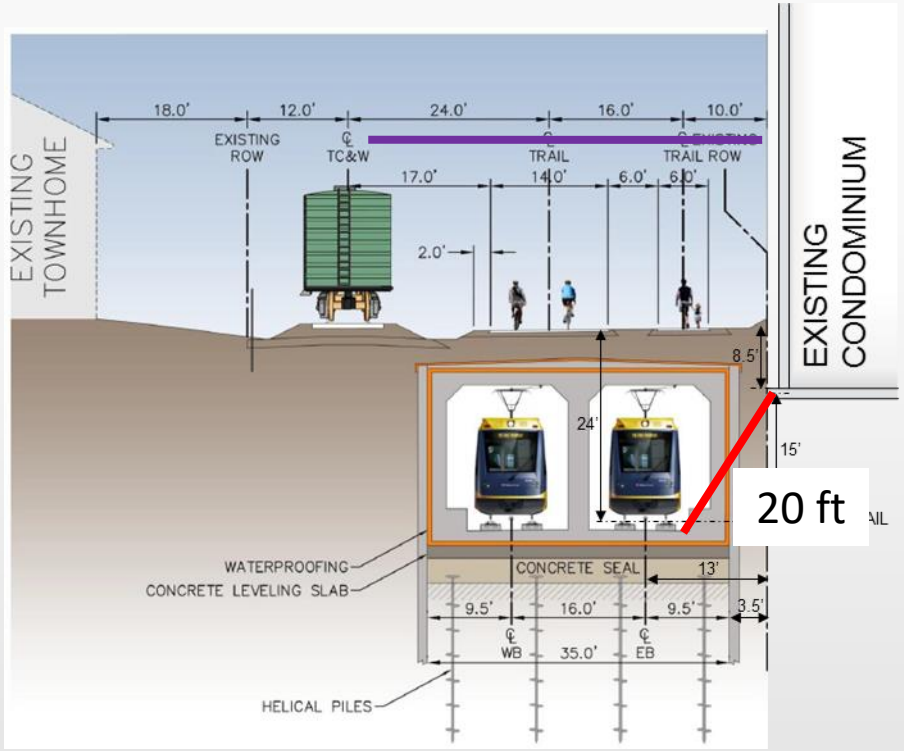
Significant damage occurred!

The Calhoun Isles structures are extremely susceptible to vibration damage, and there is a need to establish an appropriate vibration limit.

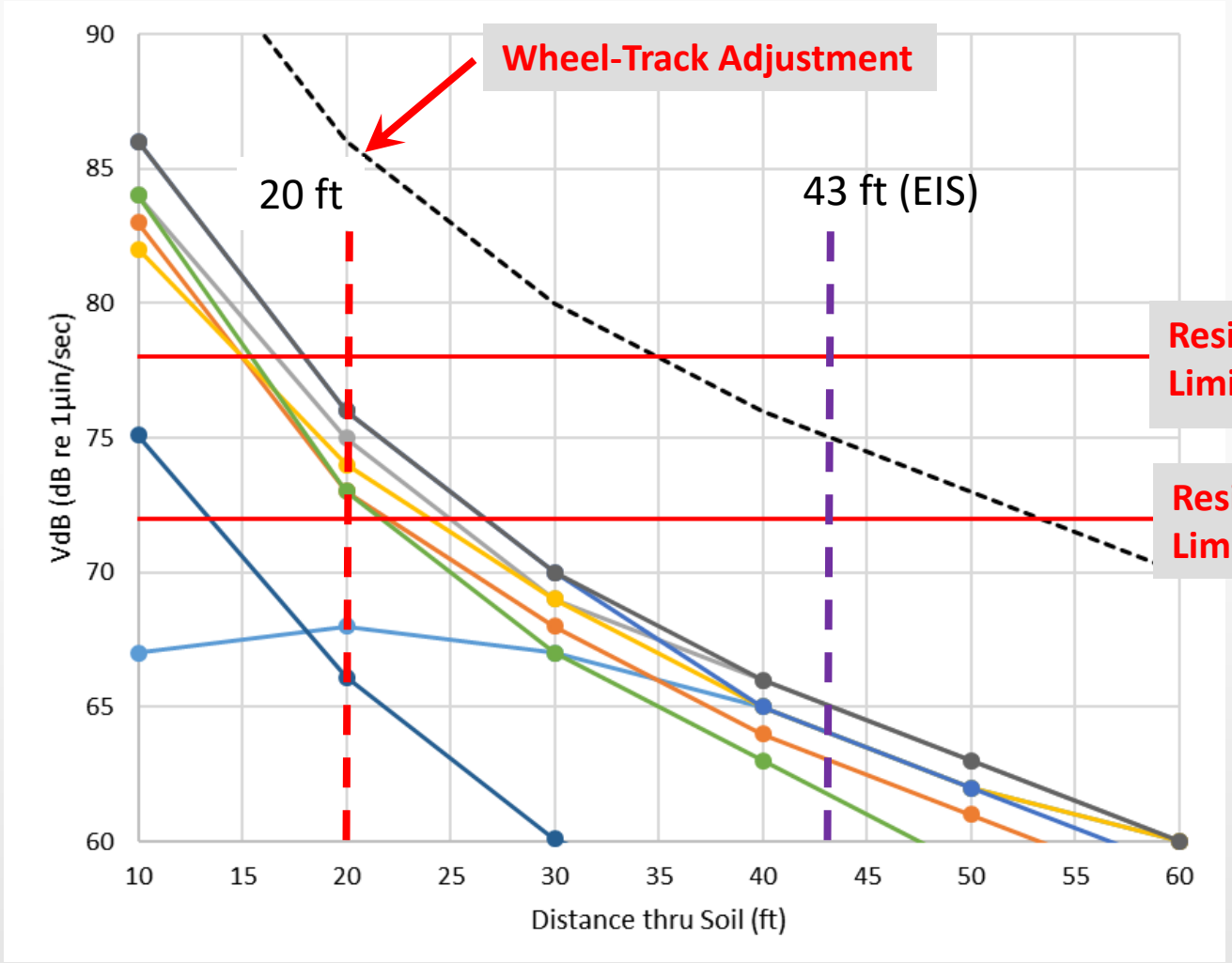
Prediction of SWLRT Operational Impacts



Operational Vibrations



43 ft



Conclusions & Recommendations

- Conclusions re: construction vibrations:
  - The Calhoun Isles structures are extremely susceptible to vibration damage
  - Proposed vibration limits are 2.7 times the level of vibration that resulted in $30k in damage
- Recommendation
  - Establish an appropriate vibration limit, via a susceptibility study

- Conclusions re: operational vibrations:
  - Operational vibrations have the potential to exceed both night and day limits
  - Significant uncertainty re: the impact of the large concrete slab and the path
- Recommendations
  - Conduct computer modeling of the vibrations to determine path and impact of slab

Components of a Susceptibility Study

- Construction vibration assessment (Is there something special about the high rise that produced damage at such low vibrations?)
  - Task 1: Develop Detailed Monitoring Plan
  - Task 2: Select, Rent, and Install Equipment
  - Task 3: Collect Vibration Data
  - Task 4: Analyze Data
- Operational vibrations
  - Task 5a: Prediction Using Attenuation Relations
  - Task 5b: Prediction Using Computer Modeling
- Time frame 2-4 months, won't delay SWLRT