

FIRE AERIAL LADDERS:

IMPROVING EASE AND SAFETY WITH SMALLER RUNG SPACING

Currently, fire aerial ladders have 14" rung spacing, which may not be the best ergonomic design for firefighters. Researchers tested 12" rung spacing and compared it to 14" rung spacing.

Reduced rung spacing resulted in:

- ✓ Increased climbing speed
- ✓ Increased toe/foot clearance
- ✓ Reduced ankle twisting
- ✓ Reduced hand forces
- ✓ Reduced foot forces

Potential benefits:

- ✓ Lower muscle/joint stress
- ✓ Lower risk of tripping
- ✓ Better climbing efficiency
- ✓ Better climbing safety

12" vs 14"



Photo courtesy of: Emily Renner and The Granville Volunteer Fire Department

For more information visit: WWW.CDC.GOV/NIOSH/FIREFIGHTERS/

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Simeonov P, Hsiao H, Armstrong T, Fu A, Woolley C, Kau T-Y. (2020). Effects of aerial ladder rung spacing on firefighter climbing biomechanics. *Applied Ergonomics* 82, 102911. <https://doi.org/10.1016/j.apergo.2019.102911>