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| Testo di partenza  \*NON tradurre il testo evidenziato in giallo | Testo tradotto dal candidato | Spazio a disposizione del correttore | Penalità |
| **Hyperloop Concept and Engineering Design** |  |  |  |
| **Infrastructure**  The primary infrastructure feature of the Hyperloop system is a continuous low-pressure tube connecting two locations that would either be installed underground, effectively creating a tunnel, or elevated above ground using pylons. |  |  |  |
| The elevated tube format is understood to be the preferred approach. However, in dense urban areas with no suitable corridor, the below surface format (underground solution) would provide an alternative option. The below surface format is less preferable due to the cost of boring/cut and cover construction techniques and potential existing utility conflicts. The above-ground design allows for easier access maintenance and security, a lower infrastructure footprint relative to most other transport infrastructure installed at-grade, and the potential for increased corridor capacity in congested areas. The travel speeds envisaged will limit the maximum curvature and gradient of the infrastructure alignment, which might limit the number of suitable routes in urban areas. |  |  |  |
| A clear benefit of the pressurized tube, whether constructed underground or elevated, is that it can potentially protect the system from adverse environmental effects, such as flooding or bad weather, and removes the possibility of vegetation or wildlife impeding the path of the vehicles, notionally reducing maintenance costs and the risk of service disruption along the corridor. However, it should be noted that the tubes are expected to require regular maintenance and could be at risk of damage from extreme environmental events. |  |  |  |
| Tube diameter and choice of material are also important engineering design considerations. The choice of tube diameter is a complex trade-off between vehicle size, speed, power consumption, and cost, whereas the tube material used is a trade-off between stiffness (i.e. structural strength), leakage, environmental impact, and cost. |  |  |  |
| Based on public information and their questionnaire responses, we know Hyperloop developers intend to use a tube diameter of three to five metres and the most common material of choice referenced has been steel, followed by reinforced concrete (or a combination of the two). While both materials are recognized as preferred construction material by developers, further testing and understanding are needed to assess their application for different environments. |  |  |  |
| Developers have identified other materials such as fibreglass and certain plastic composites that could support a low-pressure environment. However, development costs and the limited availability of infrastructure capable of producing the quantities required has, to date, constrained research into these alternatives. |  |  |  |
| There remain some challenges in the construction of Hyperloop infrastructure, notably if the tube is elevated above the ground on pylons. The high speed of travel coupled with the long, continuous tube structure can result in a high dynamic amplification factor (i.e. damaging vibrations). |  |  |  |
| To overcome this, tube designs will either have to be much stiffer than conventional designs suggest, or the length of continuous tube sections will have to be reduced to only a few pylon spans. This, in turn, may negatively impact the low-pressure environment due to the increased number of joints and the complexity of installation. |  |  |  |

Fonte: <https://tcdocs.ingeniumcanada.org/sites/default/files/2020-08/Hyperloop%20prelim%20study.pdf>

Destinatari: Professionisti del settore