Finding space for the future

To use our space more efficiently, the Government is looking to launch its Underground Master Plan in 2019. Here are some subterranean ideas that are being explored.

**Reservoirs**
Water can be stored in underground reservoirs, with the national water agency PUB currently looking into an idea that can free up significant parcels of land for development. The 17 reservoirs currently occupy 3,700ha, or around 5 per cent of Singapore's total land.

**SecureMyBike**
In Admiralty, the Land Transport Authority completed the first automated underground bicycle parking space, known as SecureMyBike. Users can leave their bikes at kiosks located above ground, which then houses them in storage cells extending up to 10m underground.

**Road and rail networks**
To enhance our living environments, future major road and rail networks, especially those that will cut through built-up areas, will be located underground. This reduces the impact of noise and dust on homes.

**Deep Tunnel Sewerage System**
This is a network of tunnels that operates on gravity, and transports sewage and waste water across the island to two centralised water reclamation plants.

**Bus interchange**
The new Bidadari housing estate will be home to Singapore's first underground air-conditioned bus interchange below Housing Board flats. Slated for completion by 2019, it will sit below a carpark and a garden, and will likely cater to five bus services.

**Common Services Tunnel**
More than just space-saving measures, underground pipes are less prone to external wear and tear. The Common Services Tunnel in Marina Bay is a creative way of housing all utilities together. This frees up land, with lesser maintenance disruptions on the roads.

**Waste disposal**
In housing estates, trash can be carried away to a centralised bin centre through a suction force via underground pipes, using pneumatic waste conveyance systems. Such a waste disposal network can be seen in an HDB estate in Yuhua, removing the need for refuse workers to manually collect waste from each block.

**Air-conditioning pipes**
Chilled water used for air-conditioning could be supplied centrally through an underground network of pipes, known as a district cooling system. This is already done in Marina Bay, and the authorities are looking to implement them in the Punggol Digital District.

**Ammunition facility**
The underground ammunition facility built under a quarry in Mandai in 2008 stores ammunition and explosives. It frees up land about half the size of Pasir Ris town.

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**Jurong Rock Caverns**
The Jurong Rock Caverns under Jurong Island is for petrochemical storage. In phase one, its five caverns are as high as nine storeys, saving approximately 60ha of land.