

Small Vehicle Construction Rules v4

These guidelines are based on the existing Vehicle Construction Rules and the Protomech Construction Rules. These guidelines can be used to create tracked, wheeled, hover and VTOL vehicles ranging in mass from 50kg to 4500kg.

The Design Process: (Note: All masses are in kilograms & 1 ton = 1000kg.)

1. Choose Vehicle Type, Technology Base & Mass.
2. Control Components- Mass 5% of the vehicle's mass. Cost: 10cb per kg.
3. Internal Structure- Mass 10% of the vehicle's mass. Cost: 10cb per kg.
4. Lift Equipment/Rotors for VTOL & Hover vehicles- Mass 10% of the vehicle's mass. Cost: 20cb per kg.
5. Engine Rating & Mass- this part is based on the Protomech Construction Rules and some additional ideas.
 - a. Choose the vehicle's Flank MP and divide by the appropriate MP divisor (MPD) listed below.
 - i. Tracked Vehicles- No MPD.
 - ii. Wheeled Vehicle, Enclosed - MPD 1.25
 - iii. Wheeled Vehicle, Motorcycle (2 to 4 Wheels) – MPD 1.5
 - iv. Road-Only Wheeled Vehicles, Enclosed & Motorcycle (Limited to roads & restricted to ¼ Gross Vehicle Weight for Cargo Carry Rule in the BMR): MPD 1.75
 - v. Hover Vehicles- MPD 2
 - vi. WiG Equipped Hover Vehicles (See Special Equipment below)- MPD 2.5
 - vii. VTOL Vehicles- MPD 2.5
 - viii. Light Aircraft (Fixed Wing)- MPD 2.5
 - b. Multiply the adjusted Flank MP by the vehicle mass then divide by 1000.
 - c. Round to the nearest whole number. Or tenth (.1) if the number is below one. This is the engine's rating. This may need to be done several times to get the optimal speed for your vehicle.
 - d. Engine Mass:
 - i. Fusion Engine- Mass: As per Engine Chart in the BMR, multiplied by 1.5
Cost: 5000cb per rating point. [*Designer's Note:* Cray has pointed out to me that there are no practical fusion engines at ratings below 10 for use in combat vehicles, despite the presence of 40kg fusion rechargers in Clan inventories. This is because, as Cray put it, "Tiny fusion engines do not have adequate mass in their reactor vessels to contain the heat of their plasmas, should the containment fields fail, unlike larger engines. Note how engines bottom out at 0.25 tons for XL 10, 15, 20, and 25-rated fusion engines." Don't blame him if you don't like it though. This is basically the in-character canon explanation for why BA suits do not mount tiny fusion engines (See *CBT: Companion*, pg230-231 and pg241-242).
 - ii. ICE Engine Mass: 50kg per rating point. Cost: 200cb per rating point.
6. Small Vehicle Spaces- all small vehicles have a limited amount of space for their driver, passengers and equipment. Vehicle control components, internal structures, lift equipment, engines, and special equipment listed in section 10 do **not** require an SVS. It is assumed

that space that is included in the design. Each vehicle has a number of Small Vehicle Spaces (SVS) equal to its mass divided by 100kg. Round fractions up.

- a. Each person carried by the vehicle, *including the driver*, requires 1 SVS: 2 if the vehicle is equipped as an RV.
 - b. Cargo massing up to 10kg does not require an SVS; any additional cargo requires as 1 SVS. Cargo and passengers carried using the Cargo Carrier rule from the BMR does not require an SVS.
 - c. Armor- standard vehicle armor does not require an SVS. Ferro-Fibrous armor requires 1 SVS.
 - d. Weapons- the various weapons mounts require space to be operated without obstruction. This does not include the space for the gunner.
7. Crew & Passenger Accommodations- all persons carried by the vehicle require space and mass. The amount per person varies based on the class of the vehicle. This mass represents the size and comfort of the seating and amenities within the vehicle such as wet bars. Recreation type vehicles outfitted for sleeping double the mass for each person as listed below.
 - a. Economy Class: Adult 70kg, Child 25kg.
 - b. Standard Class: Adult 75kg, Child 30kg.
 - c. Luxury Class: Adult 100kg.
8. Armor-
 - a. Single Occupancy Vehicles- the armor would be spread over the entire vehicle in the same way armor is spread over a Battle Armor suit. The armor is added in 1 AP increments.
 - b. All Other Vehicles- armor is applied to the 4 faces of the vehicle just like large vehicles. This is because passenger vehicles have a relatively large surface area.
 - c. Standard Armor Mass per AP: 62.5kg. Cost: 625cb per AP.
 - d. Ferro-Fibrous Armor Mass per AP: 55.5kg. Cost: 1250cb per AP.
9. Weapons- No weapons from the BMR can be mounted on small vehicles. Weapons from the *Lostech* are used. Weapons would be mounted in one of three ways.
 - a. Simple Pintle Mount- this is a simple post with a swivel connector at the top. Mass: 2kg. Cost: 50cb each. Arc: front, rear, left or right. As per BMR arcs for vehicles. SVS: 1.
 - b. Turret Type Pintle Mount- pintle mount attached to a rail. It slides on the rail around the roof hatch of the vehicle. Mass: 5kg. Cost: 250kg. Arcs: as per vehicle turrets in the BMR. SVS: 2.
 - c. Fixed Mount- the vehicle needs to be moved to adjust aim. The driver operates the weapon remotely. Mass: 1kg. Cost: 100cb. SVS: 1.
 - d. Gun Ports (not necessarily a mount but...)- these are basically holes cut in armor that allow a shooter to fire his weapon out of the vehicle. Mass: Nil. Cost: Nil. Arc: front, rear, left or right. As per BMR arcs for vehicles. SVS: nil (SMG or smaller weapon) or 1(carbine or larger weapon). *Example:* a delivery van with 6 SVS in the rear compartment has 6 gun ports cut into the sides. Six people each equipped with submachine guns can fire at the same time; one person would be at each gun port. There would only be room for 3 persons if they were expected to fire rifles from the gun ports.

- e. These weapon mounts and the gun port are not stabilized. They suffer an attack penalty of +1 at speeds from MP 1 to Cruise MP and +2 above Cruise MP up to Flank MP.
 - f. Vehicle Mounted Weapons Damage & Range- Calculated as per the Platoon Construction Rules in *Combat Operations*. This includes the rounding fractions down. Each arc is calculated separately.
10. Special Equipment-
- a. Semi-Autonomous Controls- these special controls allow an equipped vehicle to operate under much less supervision than a regular vehicle. Basically the vehicle does not require a driver but a supervisor that points the vehicle in the direction he wants it to travel and the vehicle picks its path. The supervisor need not be in the vehicle. A vehicle so equipped will respond to simple commands from the supervisor, be they verbal or from an electronic interface device. This allows the supervisor to divide his attention and do such things as shoot at enemy soldiers while on the move. SA controls allow a vehicle to play follow the leader with another vehicle equipped with SA controls allowing one supervisor to lead a train of small vehicles. This equipment cannot be used on a motorcycle or VTOL (?) and is limited to a speed of MP3 when under SA control. A vehicle so equipped does not require a driver's position. Mass: 10% of the vehicle mass. Cost: 15cb per kg.
 - b. Wing-in-Ground Effect Equipment- this special equipment allows a hover type vehicle to actually fly half the wing length above the surface it is flying over. Mass: 10% of the vehicle mass. Cost: 20cb per kg. [*Designer's Note*: this piece of equipment has no equivalent in CBT. I added it to account for the Turbofan Car listed in *Lostech*. For more information on Wing-in-Ground Effect go here: <http://www.fas.org/man/dod-101/sys/ship/row/rus/903.htm>.
 - c. Drone Equipment:
 - i. Drone Control Equipment: Mass 10% of the drone vehicle mass. Cost: 10cb per kg.
 - ii. Drone Sensor Equipment: Mass 10 kg (minimum, detection range: hex occupied) + 10kg per 1 hex of range. At 640kg the drone's sensor range is effectively unlimited like all other vehicles. Cost: 10cb per kg. Designer's Notes: drone sensors trace LOS for detection as all other CBT units. Drones cannot detect anything beyond their sensor range.
 - iii. Drone Carrier Control Station Equipment: as per *Maximum Tech*.
 - d. VSTOL Equipment (Light Aircraft)- Mass: 5% of the vehicle mass. Cost: 10cb per kg. *Note*: Light aircraft require a minimum of 90 meters of runway unless VSTOL capable. If VSTOL equipped the light aircraft only requires 45 meters.
11. Remaining Mass- after all the various equipment masses are added up any remaining mass can be used to carry cargo.
12. Costs- after all component costs are added up multiply the subtotal by the appropriate multiplier listed below.
- a. Tracked Vehicles: 1.75
 - b. Wheeled Vehicles, Enclosed: x1.5
 - c. Wheeled Vehicles, Motorcycles: x2
 - d. Hover Vehicles: x1.75
 - e. VTOL Vehicles: x2.0

- f. Fixed Wing Light Aircraft: x2.0
 - g. Luxury Class Vehicles: anywhere from x3 to x17.
13. BV- I haven't really thought about this other than to guess that maybe the existing vehicle BV formulas might work.

Special Case Rules:

Stabilized Weapon Mounts- Battle Armor grade weapons from the CBT Companion can be mounted in stabilized mounts in a manner similar to a regular AFV. The mounts mass 10% of the weapon mounted if a full turret and 5% if a single arc mount. Cost: 10cb per kg. These mounts do not incur attack penalties. SVS for Stabilized Mounts: 2 for a turret type, 1 for a single arc type.

Author's Note: I didn't put this section in the main body for a reason. Weapons scaled up for vehicles are large. A support machinegun scaled up masses 500kg for all of its supporting systems *without ammunition* in the existing Vehicle Construction Rules. In my opinion using BA weapons on small vehicles is getting around the existing rules and is heading into territory I do not want to go. If you want to go there more power to you though! And that's why I felt they should at least be included. Let me know how they work if you choose to use them, who knows you might change my mind.

Examples:

Two-Man Ultra light Aircraft – Light Fixed-Wing Aircraft, VSTOL Capable
For Special Forces or Mechanized Infantry (as per *Combat Operations*)

Mass	500kg
Controls	25kg
Internal Structure	50kg
Engine, ICE r 2	100kg
Cruise MP: 5	
Flank MP: 8	
Accommodations: 2 Adults	150kg
VSTOL Capable	25kg
Cargo	145kg
Cost:	2800cb

Flying Squirrel Scout Drone – light fixed-wing aircraft, VSTOL Capable

Mass	500kg
Controls	25kg
Internal Structure	50kg
Engine, ICE r 3	150kg
Cruise MP: 10	
Flank MP: 15	
Drone Control Equipment	50kg
Drone Sensor Equipment	160kg (Range 8 hex radius)
VSTOL Capable	25kg
Mass Unused	40kg
Cost:	7400cb