**Stroller wheels Types:**

**The EVA Wheel**

* Outer layer made of plastic.
* Cannot get a flat tire.
* Lighter than other wheels, making the stroller more lightweight.
* Ideal for frequent travelers using public transport.
* Easy to steer in urban environments due to lightweight design.



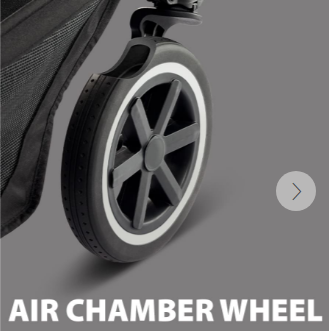
**The AirWheel**

* Similar to bicycle tyres, with an outer tyre and inner tube.
* Air inside provides extra suspension, ensuring a smooth ride.
* Excellent for off-road terrain, absorbing vibrations from obstacles like branches and stones.
* Requires careful inflation to maintain springy effect.



**The Air Chamber Wheel**

* Combines features of air wheels and solid rubber wheels.
* Contains a large air chamber for enhanced suspension and comfort.
* Puncture-proof and maintenance-free.
* Suitable for all terrains, both city and countryside.



**Stroller wheel configuration:**

### **3-Wheel Stroller**

* **Advantages:**
  + **Maneuverability**: Easier to steer, especially on uneven terrain or tight spaces due to the single front wheel.
  + **Sporty Design**: Often features an all-terrain design, suitable for jogging and outdoor activities.
  + **Stability on Rough Surfaces**: Performs well on grass, gravel, or uneven pavements.
* **Disadvantages:**
  + **Potential Stability Issues**: May feel less stable on flat surfaces, especially during sharp turns or sudden stops.
  + **Bulkier**: Generally larger and heavier, making it harder to fold and transport.

### **4-Wheel Stroller**

* **Advantages:**
  + **Better Stability**: The even distribution of weight across four wheels ensures greater stability, especially on flat, smooth surfaces.
  + **Compact and Lightweight**: Often lighter and more compact, easier to fold and transport, ideal for city use.
* **Disadvantages:**
  + **Less Maneuverable**: Can be harder to steer in tight spaces or rough terrains due to the extra wheel.

**Stroller wheels size:**

When considering stroller wheel sizes, there is no one-size-fits-all, but different sizes cater to specific needs. Larger wheels (10 to 12 inches) are better suited for rough terrain, offering better stability and smoother rides. They also work well for jogging strollers and all-terrain models. Smaller wheels (5 to 8 inches), in contrast, are ideal for lightweight strollers or urban environments where maneuverability is more critical, such as tight spaces or smooth surfaces.

Safety standards from the U.S. Consumer Product Safety Commission (CPSC) emphasize the importance of stroller wheels being robust and well-assembled to prevent tip-overs and accidents (Consumer Product Safety Commission [CPSC], n.d.; HealthyChildren.org, n.d.). Additionally, ergonomic design principles for strollers often consider wheel size to ensure smooth mobility and child safety (Frontiers, n.d.).

Choosing the right wheel size largely depends on your primary use. If you’ll be on varied terrains or uneven surfaces, opt for larger wheels. If portability and city use are key, smaller wheels may suit your needs better.

**Special note:**

The three-wheel design can be less ideal for boarding public transportation because users typically lift the stroller by tipping it onto its rear wheels, followed by the front wheel. With a 3-wheel stroller, this process requires extra effort to maintain lateral balance when placing the front wheel down, increasing the risk of instability during boarding.

**Alternatives to wheels:**

**Omni Directional Wheels**

### **Pros:**

1. **Superior Maneuverability**: Omnidirectional wheels allow for movement in any direction without needing to change the orientation of the stroller. This feature is particularly beneficial in tight spaces, enabling users to navigate smoothly around obstacles​([Felgains](https://www.felgains.com/blog/how-do-robooters-omnidirectional-wheels-work-plus-benefits-explained/))​([Monroe Engineering](https://monroeengineering.com/blog/top-5-benefits-of-omni-wheels/)).
2. **Enhanced Stability**: These wheels can provide better load stability, as they are designed to maintain a consistent center of gravity. This stability is essential for preventing tip-overs, especially in uneven terrains​([Monroe Engineering](https://monroeengineering.com/blog/top-5-benefits-of-omni-wheels/))​([Felgains](https://www.felgains.com/blog/how-do-robooters-omnidirectional-wheels-work-plus-benefits-explained/)).
3. **Improved Traction**: The unique design of omnidirectional wheels enhances traction, which can be particularly helpful on various surfaces, including gravel and grass​([Felgains](https://www.felgains.com/blog/how-do-robooters-omnidirectional-wheels-work-plus-benefits-explained/)).
4. **Easier to Use**: With their ability to slide laterally, omnidirectional wheels can make it easier to turn and navigate in crowded or confined spaces, reducing the risk of bumping into other objects​([Monroe Engineering](https://monroeengineering.com/blog/top-5-benefits-of-omni-wheels/)).

Cons:

1. **Potential for Wear**: While omnidirectional wheels are durable, they may experience more wear over time than traditional wheels due to their complex design. The small rollers can be susceptible to damage if exposed to harsh conditions​([Monroe Engineering](https://monroeengineering.com/blog/top-5-benefits-of-omni-wheels/))​([Felgains](https://www.felgains.com/blog/how-do-robooters-omnidirectional-wheels-work-plus-benefits-explained/)).
2. **Cost**: Strollers equipped with omnidirectional wheels can be more expensive compared to those with standard wheels. The advanced technology and materials used in their construction often come at a premium​
3. **Complexity in Maintenance**: The unique design may require more intricate maintenance or repairs than traditional wheels, potentially complicating upkeep for users​([Felgains](https://www.felgains.com/blog/how-do-robooters-omnidirectional-wheels-work-plus-benefits-explained/))​([Monroe Engineering](https://monroeengineering.com/blog/top-5-benefits-of-omni-wheels/)).
4. **Less Efficient on Smooth Surfaces**: On flat, smooth surfaces, omnidirectional wheels may not provide a significant advantage over traditional wheels and could even be less efficient due to their rolling resistance​​([Felgains](https://www.felgains.com/blog/how-do-robooters-omnidirectional-wheels-work-plus-benefits-explained/)).

**Fixed vs Swivel Wheels:**

### **Fixed Wheels (Rigid Wheels)**

**Pros:**

* **Stability:** Fixed wheels provide better stability, especially when moving in a straight line. They are commonly used for heavy loads.
* **Direction control:** These wheels only move forward or backward, making them ideal when you want to maintain a specific path without much deviation.
* **Strength:** Fixed wheels are often stronger and more durable for handling heavy or bulky loads.
* **Simplicity:** Fewer moving parts can mean they are less prone to mechanical failure.

**Cons:**

* **Limited maneuverability:** Since they don’t swivel, fixed wheels are harder to maneuver around corners or in tight spaces.
* **Turning requires effort:** When changing direction, you'll have to lift or pivot the object rather than just turning the wheels.

### **Swivel Wheels (Caster Wheels)**

**Pros:**

* **Maneuverability:** Swivel wheels can rotate 360 degrees, allowing easy movement in all directions. This makes them ideal for tight spaces or navigating around obstacles.
* **Flexibility:** You can push or pull an object in any direction, which is useful in dynamic environments where quick changes in movement are needed.
* **Convenience:** They are easier to push and require less effort when turning or moving objects around corners.

**Cons:**

* **Less stable:** Swivel wheels don’t provide as much stability as fixed wheels, especially at higher speeds or when moving in straight lines.
* **More complex mechanics:** Since they have more moving parts, swivel wheels may wear out faster or require more maintenance.
* **Wobbling:** At times, they can wobble or drift, making it harder to keep a straight path.

### **Combination: Fixed + Swivel Wheels**

Many applications, such as carts or trolleys, use a combination of fixed wheels on one end and swivel wheels on the other. This setup provides a balance of stability and maneuverability, offering the best of both worlds:

* **Fixed wheels for straight-line control.**
* **Swivel wheels for easier turning and navigating tight spaces.**

### **When to Use Each:**

* **Fixed wheels**: Ideal for straight-line movement, heavy loads, or when you need stability.
* **Swivel wheels**: Perfect for environments requiring frequent turns, such as in warehouses, shopping carts, or medical equipment.

**Different types of lubricant used in ball bearings:**

* **Mineral or synthetic-based lubricants** are the most common.
  + Various types exist for general use, high-speed applications, low noise, water resistance, and extreme temperatures.
* **Silicone lubricants**:
  + Offer a wide temperature range and maintain consistent viscosity with temperature changes.
  + Have good water resistance and compatibility with most plastics.
  + Not suitable for high loads and speeds.
* **Perfluorinated (PFPE) lubricants**:
  + Non-flammable, compatible with oxygen, and resistant to many chemicals.
  + Safe for plastics and elastomers.
  + Suitable for vacuum or clean-room environments due to low vapor pressure.
  + Some types withstand temperatures above 300°C.
* **Dry lubricants**:
  + Used in environments where traditional lubricants may cause contamination, such as vacuums.
  + Popular materials include molybdenum disulphide or tungsten disulphide, applied to provide smooth operation and higher running speeds than unlubricated bearings.
* **Solid polymer lubricants**:
  + Made from synthetic polymer filled with lubricating oil.
  + Common in sealed bearings for dusty environments or where leakage is unacceptable (e.g., clean environments or vertical shaft applications).
  + Provide excellent water resistance, handle regular wash-downs, and tolerate high vibration and centrifugal forces.
* **Dampening greases**:
  + Commonly used in automotive parts to prevent rattles and squeaks.
  + Provide a “quality” feel in switches, slides, threads, and gears.
  + Also used in slow rotating bearings like those in potentiometers.

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