Claims

1. Transport, storage and sequencing system for goods, comprising

   a) at least two access stations;

   b) a dedicated bidirectional transport way, comprising two transport lanes for accommodating a plurality of transport units running in both directions, along a transport route linking the at least two access stations;

   c) the transport way comprising a service lane extending along at least 66% of the transport route, the transport units being selectively divertable between the transport lanes and the service lane;

   d) a control system for controlling movement of the plurality of transport units in such a way that

      - selected transport units are temporarily stored on the service lane for a determinable time interval; and/or
      - a sequence of transport units is modified using the service lane in preparation of further processing of a subset of the transport units in one of the access stations and/or in a subsequent transporting stage

characterized in that

   e) the transport way comprises a driving surface and the transport lanes and the service lane are arranged side by side on the driving surface;

   f) the transport units are autonomous vehicles running on the driving surface;

   g) wherein the control system comprises components for centralized control as well as components for controlling individual transport units which are arranged locally on the transport units and which cooperate with sensors and drives of the transport units.

2. Transport, storage and sequencing system as recited in claim 1, characterized in that the control system is adapted to receive a transportation order specifying a pickup location, a pickup time, a delivery location and a delivery time, and in that the control system controls a transport of respective goods from the pickup location via a first of the at least two access stations, the transport way and a second of the at least two access stations to the delivery location, including the step of temporarily storing the goods on the service lane of the transport way if required to meet the delivery time.

3. Transport, storage and sequencing system as recited in claim 1 or 2, characterized in that temporary storage on the service lane is managed by a dynamic storage regime with respect to choosing storage space areas of the service lane and storage locations for goods in the storage space areas.

4. Transport, storage and sequencing system as recited in one of claims 1 to 3, characterized in that at least 66% of the transport way is accommodated in a subterranean tunnel and in that the at least two access stations connect the subterranean tunnel to the surface.

5. Transport, storage and sequencing system as recited in claim 4, characterized in that the at least two access stations comprise a vertical feeding system for feeding transport units between the transport way and a transfer station on the surface.

6. Transport, storage and sequencing system as recited in claim 1, characterized in that each of the transport units comprise an electrical energy store and in that the electrical energy store is chargeable from a power supply integrated in the driving surface.

7. Transport, storage and sequencing system as recited in claim 6, characterized in that the transport units are controllable to relocate themselves during processing in the access stations.

8. Transport, storage and sequencing system as recited in one of claims 1 to 7, characterized by an additional transport way for transporting individual goods of limited dimensions independent from the dedicated bidirectional transport way.

9. Transport, storage and sequencing system as recited in claim 8, characterized in that the additional transport way comprises an overhead conveyor for the transport of suspended containers for accommodating the individual goods.

10. Transport, storage and sequencing system as recited in any of claims 1 to 9, characterized in that a production facility is integrated in one of the at least two access stations, wherein basic materials, consumables, semi-manufactured products and/or final product are supplied and removed via the transport way.

11. Transport, storage and sequencing system as recited in any of claims 1 to 10, characterized by a secondary transport system running on a non-dedicated transport infrastructure, goods being transferable between the transport way and the secondary transport system at the at least two access stations, the control system disposing transport of the goods along both the transport way and the secondary transport system.

12. Transport, storage and sequencing system as recited in claim 11, characterized in that the secondary transport system comprises a plurality of autonomous vehicles running on a public street infrastructure, the goods being automatically transferable between the transport units and the autonomous vehicles of the secondary transport system at the at least two access stations.

13. Method for transporting, storing and sequencing goods using a transport, storage and sequencing system as recited in any of claims 1 to 12, comprising the following steps:

    a) accepting the goods at a first of at least two access stations;

    b) transporting the goods from the first access station to a second of the at least two access stations, using a dedicated bidirectional transport way, comprising two transport lanes for accommodating a plurality of transport units running in both directions, along a transport route linking the at least two access stations, the transport way comprising a service lane extending along an essential proportion of the transport route, the transport units being selectively divertable between the transport lanes and the service lane;

    c) temporarily storing selected transport units on the service lane for a determinable time interval;

    d) modifying a sequence of transport units using the service lane in preparation of further processing of a subset of the transport units in one of the access stations and/or in a subsequent transporting stage;

    e) providing the transported goods at the second access station for retrieval or further transport.

14. Method as recited in claim 13, characterized by the steps of

    - receiving a transportation order specifying a pickup location, a pickup time, a delivery location and a delivery time; and

    - controlling the transport of the respective goods from the pickup location via a first of the at least two access stations, the transport way and a second of the at least two access stations to the delivery location, including the step of temporarily storing the goods on the service lane of the transport way if required to meet the delivery time.