CLAIMS

1. A structure for a vehicle, comprising:

a plurality of panels or tubes having honeycomb shaped or other geometric or organic internal structures; and

a plurality of joint members, each joint member configured to mate with at least a subset of the plurality of panels or tubes to form a three-dimensional structure,

wherein the internal structures are formed by 3-D printing.

2. The structure of claim 1, wherein the three-dimensional structure is formed to meet safety considerations for the vehicle.

3. The structure of claim 2, wherein at least one of the plurality of panels or tubes or the plurality of joint members is designed to break or deform in a controlled and directed manner upon a collision of the vehicle exceeding a threshold force.

4. The structure of claim 1, wherein the plurality of joint members are formed by 3-D printing

5. The structures of claim 1, wherein the plurality of joint members are connected via 3-D printed features, including bosses and channels designed to created sealed chambers allowing injection of adhesive, and introduction of vacuum to ensure proper adhesive application.

6. The structure of claim 1, wherein a plurality of tubes mate with at least one joint member.

7. The structure of claim 1, wherein at least one panel of the plurality of panels comprises mounting features to be connected with at least one joint member or other panel.

8. The structure of claim 1, wherein at least a subset of the three-dimensional structure is removable and interchangeable with another set of components to provide the vehicle with desired safety or performance characteristics.

9. A vehicle chassis support component comprising:

at least one outer surface;

an internal structure within an interior bound by the outer surface; and

one or more mounting features that permit the vehicle chassis support component to connect with one or more other structural members of the vehicle,

wherein the internal structure of the support component is integrally formed with the at least one outer surface by a 3-D printer.

10. The vehicle chassis support component of claim 9, wherein the internal structure are joint through direct metal laser sintering or other joining technique with 3D printed features which are added to the vehicle chassis support component.

11. The vehicle chassis support component of claim 9, wherein the internal structure comprises at least one of the following three dimensional structures: honeycomb structure, bone structure, porous structure, tetrahedral bracing, and columnar structure, extruded members.

12. The vehicle chassis support component of claim 9, wherein the at least one surface comprises a first sheet and a second sheet forming an outer surface of a vehicle panel, and wherein the internal structure is between the first sheet and the second sheet.

13. The vehicle chassis support component of claim 9, wherein the at least one surface is enclosing the internal structure, forming an outer surface of a vehicle tube or extruded member.

14. The vehicle chassis support component of claim 9, wherein the one or more structural members comprises at least a joint member having one or more connecting features to be mated with the vehicle chassis support component.

15. The vehicle chassis support component of claim 14, wherein the at least one joint member is formed by a 3-D printer.

16. The vehicle chassis support component of claim 9, further comprising inserting features to accept functional components.

17. The vehicle chassis support component of claim 16, wherein the functional components are node members for determining a location of the vehicle chassis support component relative to other components in a vehicle.

18. A structure for a vehicle, comprising:

a plurality of panels, extrusions, castings, moldings or tubes; and

a plurality of joint members, each joint member configured to mate with at least a subset of the plurality of panels, extrusions, castings, moldings or tubes to form a three-dimensional structure,

wherein the joint members are formed by 3-D printing, and wherein the 3-D printed joint members have 3D printed internal features to support the application of adhesives or introduction of fasteners for connection to the plurality of panels, extrusions, castings, moldings or tubes; and

wherein the plurality of panels, extrusions, castings, moldings or tubes are enabled to pass through the joint member, enabling structural continuity of that structural component,

while still allowing the joint member to be joined to the component with adhesives or fasteners enabled by 3-D printed features.

19. A structure for a vehicle, comprising:

one or more extrusions that are trimmed after extrusion to enable close fit to a body surface wherein the one or more extrusions allow passage of vehicle components through them; and

one or more joint members, each joint member configured to mate with at least a subset of the plurality of extrusions to form a three-dimensional structure,

20. The structure of claim 19, wherein the three-dimensional structure is formed to meet safety considerations for the vehicle.

21. The structure of claim 20, wherein at least one of the extrusions or the plurality of joint members is designed to break or deform in a controlled and directed manner upon a collision of the vehicle exceeding a threshold force.

22. The structure of claim 19, wherein the plurality of joint members are formed by 3-D printing.

23. The structure of claim 19, wherein a plurality of joint members mate with at least one extrusion.

24. The structures of claim 19, wherein the one or more extrusions are connected via 3-D printed features, including bosses and channels designed to create sealed chambers allowing injection of adhesive, and introduction of vacuum to ensure proper adhesive application joining them to the joint members.

25. A method of fabricating a vehicle, the method comprising:

designing a vehicle chassis comprising (1) one or more connecting tubes, extrusions, molded parts, cast parts, or panels, and (2) one or more joint members, by incorporating one or more safety considerations into a design of the vehicle chassis;

determining a stress direction and magnitude to be exerted by the one or more connecting tubes or panels at the one or more joint members; and

manufacturing the one or more joint members, each joint member having a configuration that (1) supports the stress direction and magnitude, and (2) incorporates the one or more safety considerations;

wherein the one or more connecting tubes or panels comprise a honeycomb structure.

26. The method of claim 25, wherein the one more joint members comprise a honeycomb structure.

27. The method of claim 25, wherein the joint member is configured to cause the one or more connecting tubes or panels, or the one or more joint members, to break or deform in a controlled and directed manner upon a collision of the vehicle exceeding a threshold force.